

COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES APPROPRIATIONS FOR FISCAL YEAR 2014

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

NONDEPARTMENTAL WITNESSES

[CLERK'S NOTE.—The subcommittee was unable to hold hearings on nondepartmental witnesses. The statements and letters of those submitting written testimony are as follows:]

PREPARED STATEMENT OF THE AD ASTRA ROCKET COMPANY

My name is Dr. Franklin Chang Diaz, and I appreciate the opportunity to provide a statement to this Subcommittee on an important topic related to the National Aeronautics and Space Administration, its fiscal year 2014 budget proposal, and the electric propulsion system challenges and decisions ahead.

Ad Astra Rocket Company is an innovative, developing stage, high technology American company, domiciled in Webster, Texas near the Johnson Space Center. The key technology for the company is the VASIMR rocket, a high-power plasma rocket technology, which is uniquely American and presently the most advanced of its class. In the near term, the VASIMR rocket will be powered by advanced solar arrays from 50 kW to several 100s of kW. In this form, VASIMR is Solar Electric Propulsion (SEP) technology whose commercial deployment could greatly increase in-space transportation capability over conventional chemical rockets (through greater payload and reduced costs). In the longer term, high-power VASIMR engines will scale into multi-megawatts, suitable for advanced nuclear electric power systems, enabling faster and more flexible human and robotic deep space missions than are possible with conventional chemical and nuclear-thermal technologies currently being considered by NASA.

Since its inception as a private company in 2005, Ad Astra has matured the VASIMR technology exclusively on more than \$30 million of private investment and has brought the engine to a high state of development. In December 2008 Ad Astra signed a Space Act Agreement with NASA to test a VASIMR engine on the International Space Station as an ISS National Laboratory payload. Ad Astra's proposal was duly submitted in February 2010, as required by the Space Act Agreement, but budget constraints have precluded NASA from providing any funding. Ad Astra has requested NASA to extend the term of the Space Act Agreement to provide more time for the partnership to reach the flight goal. Verbal agreement to do this was obtained on October 9, 2012 and signed in December 2012. Our company continues to march to this critical goal presently targeted for 2016.

THE ISSUE: HIGH-POWER ELECTRIC PROPULSION SYSTEMS

High-power solar electric propulsion (defined by the National Research Council as 30 kW to 600 kW) is essential to support a robust, commercial space operations market. It is also a key technology required for long-term space exploration. It is listed as one of the nation's highest priority space goals by the recent National Research Council's 2012 report on Space Technology Roadmaps and Priorities:

"EP systems have a higher propellant efficiency than other in-space propulsion technologies that will be available in the foreseeable future, with applications to all NASA, Department of Defense (DOD), and commercial space mission areas . . .

Development of high-power EP systems (30 kW to 600 kW) will enable larger scale missions with heavy payloads, including development of a more efficient in-space transportation system in Earth-space, sample returns from near-Earth objects (NEOs), the martian moons, other deep space destinations . . . , precursor demonstrations of in-situ resource utilization (ISRU) facilities, and pre-placement of cargo for human exploration missions." (pp. 118–119, NASA Space Technology Roadmaps and Priorities: Restoring NASA's Technological Edge and Paving the Way for a New Era in Space, 2012) http://www.nap.edu/openbook.php?record_id=13354&page=119

NASA's fiscal year 2014 Budget Request has recognized this priority as well, and that document identifies 300 kW as the target power for high-power electric propulsion.

"Solar Electric Propulsion Technologies: For the purpose of future human missions beyond low Earth orbit, and to support the robotic segment of the proposed asteroid retrieval mission, one of the highest priority technology development needs is high power (approximately 300 kilowatts) Solar Electric propulsion." (TECH 34, NASA fiscal year 2014 Budget document)

In order to accomplish this important goal, NASA should explore more than just one, and certainly at least two, of the technologies for high-power electric propulsion currently under development, both inside and outside of NASA. Particular attention should be given to those rocket systems having favorable scalability features to high-power applications. With more than 10,000 reliable high-power firings to date, the VASIMR engine is one of them. It has demonstrated high performance (up to 200kW, 5000sec Isp, 6 N thrust) efficiency (up to 72 percent) and scalability in the laboratory. However, as its fiscal year 2014 budget documents suggest, NASA has prematurely down-selected the Hall thruster as the only SEP option for NASA's proposed asteroid retrieval mission. This decision shuts out potential competing technologies, such as VASIMR-SEP, with equal or superior capabilities. Pursuing at least two distinct high-power electric propulsion technologies increases redundancy, reduces program risk, and is consistent with sound business practices.

Hall thrusters are intrinsically low power density devices, very well suited for small spacecraft and satellite orbit maintenance, but they do not scale well to the high-power range. They have benefitted from many decades of Government support and their performance in the low power niche is certainly not to be diminished. But at 500 tons, even a small asteroid is too big and Hall thrusters must resort to clustering (many thrusters grouped together) to meet even the low end of the high-power range. While clustering may be viewed as increasing redundancy it also leads to system complexity, size and weight. The VASIMR engine is a higher (10x) power density (6 MW/m^2) device that leads to a smaller, simpler system that also favorably scales to much higher power levels. Another important consideration is the availability and cost of the propellant used. Hall thrusters use xenon, a rare and expensive gas (approximately \$1000/kg), while the VASIMR runs on multiple propellants, including argon (approximately \$5/kg) and krypton (approximately \$300/kg).

In my judgment, the 50kW target power NASA has set for the asteroid retrieval mission surely sets the bar too low, barely in the acknowledged range of high-power. For a mission whose planning and execution will span nearly a decade, this is hardly in the bold and imaginative character of our nation and NASA. Targeting the middle of the range (approximately 300kW) would be more in line with what is truly "game changing." An asteroid retrieval mission is an exciting and long-term project, a motivator to our youth and to our nation's entrepreneurs. If properly defined, this effort could stimulate the development of true high-power electric propulsion with substantial leveraging from the private sector and open many other areas of application for the technology, commercial and otherwise. These will have a profound impact on sustainable space transportation and on our nation's capability to maintain preeminence in space technology. VASIMR would be proud to compete with Hall thrusters or any other technology in this arena, on a level playing field, in a free and open environment where the Government does not become the competitor.

Ad Astra Rocket has worked successfully with private investors as well as with NASA during this technology development period. As an astronaut and physicist, I have worked alongside a team of more than 50 American scientists on this technology since 1980—at first with NASA and currently as CEO of Ad Astra. Throughout the past 30 years, I have endeavored to work closely with my former Agency. Since our company's inception in 2005, there have been numerous non-reimbursable agreements with NASA, allowing the Agency to continue to benefit from our rapid progress on the technology development, enabled by more than \$30 million of private investment. However, none of these agreements have involved any transfer of

Federal funds to Ad Astra. A small Federal investment would act as a strong amplification factor on private investment and, in terms of “bang for the buck,” would result in a considerable leveraging effect for the Government.

WHY IS THIS SUPPORT IN THE BEST INTEREST OF THE U.S.?

The financial leveraging capability of the VASIMR team has been amply demonstrated. A reasonable, yet compelling expression of direct Government support would not be unusual. It is in line with current space policy (COTS Program at NASA promoting greater participation of the U.S. private sector in the space program) and would greatly enhance this leveraging capability. Such action will enable the VASIMR technology to be quickly commercialized by the United States for a large stake of the global market at a relatively low development cost to the taxpayer due to the strong private leveraging. The \$30 million in private sector investment is already creating high technology jobs in the U.S. We have also inspired young minds by sponsoring dozens of college internships and multiple PhD and Masters Theses in physics and engineering.

The VASIMR rocket has been predominately developed by a small entrepreneurial, minority-owned business in Texas. In doing so, the company has developed an outstanding expertise in high-power electric propulsion and related technologies. The private venture alone has been fielding the totality of the cost to date with U.S. and foreign investors. However, without a compelling expression of interest and support from the largest space agency in the world, it will be difficult to maintain a credible case with private investors alone. Now is the time for NASA to take a closer look at this new and powerful electric propulsion technology. For while the U.S. is now well ahead of potential international competitors in this field, in time, and given the excellent technical results obtained thus far, VASIMR-like development projects are likely to be initiated by other space-faring nations who have the scientific capability to do so. This could preempt the U.S. from reaping the economic and engineering benefits of this technology.

In conclusion, NASA is at a critical juncture with regard to the future of high-power electric propulsion and its impact on U.S. leadership in deep-space exploration. The technology is potentially “game changing” but its full maturation requires a bold and ambitious step on the part of the U.S. Government, which is bound to save taxpayer money in the long run. Our small company has already taken that step and we, and our more than 200 investors, are committed to continuing on course. As Americans, we would be most proud to say that the U.S. Government and NASA are our partners in this mission. We look to your committee’s leadership to insist that the 2014 budget provide the proper framework for allowing VASIMR and the full range of high-power electric propulsion technologies to fully develop. Thank you.

PREPARED STATEMENT OF THE AMERICAN GEOSCIENCES INSTITUTE

To the Chairwoman and members of the Subcommittee: The American Geosciences Institute (AGI) supports Earth science research sustained by the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), the National Institute of Standards and Technology (NIST), and the National Aeronautics and Space Administration (NASA). Frontier research on the Earth, energy, and the environment has fueled economic growth, mitigated losses, and sustained our quality of life. The Subcommittee’s leadership in supporting geoscience-based research is even more critical as our nation competes with rapidly developing countries, such as China and India, for energy, mineral, air, and water resources. Our nation needs skilled geoscientists to help explore, assess, and develop Earth’s resources in a strategic, sustainable, and environmentally sound manner and to help understand, evaluate, and reduce our risks to hazards. AGI supports the President’s requests for fiscal year 2014 of \$7.626 billion for NSF, \$928 million for NIST, and \$1.85 billion for Earth Science at NASA, plus \$5.45 billion for NOAA.

AGI is a nonprofit federation of 48 geoscientific and professional societies representing more than 250,000 geologists, geophysicists, and other Earth scientists. Founded in 1948, AGI provides information services to geoscientists, serves as a voice for shared interests in our profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in society’s use of resources, resilience to hazards, and the health of the environment.

NSF.—AGI supports an overall budget of \$7.626 billion for NSF. The forward-looking investments in NSF are fiscally responsible and will pay important dividends in future development that drives economic growth, especially in critical areas

of sustainable and economic natural resources and reduced risks from natural hazards. Support for science will save jobs, create new jobs, support students, and provide training for a 21st century workforce.

NSF Geosciences Directorate.—The Geosciences Directorate (GEO) is the principal source of Federal support for academic Earth scientists and their students who are seeking to understand the processes that sustain and transform life on this planet. Approximately 60 percent of support for basic research in the geosciences at academic institutions comes from this directorate.

AGI asks the Subcommittee to fund the President's request for \$267 million for Atmospheric and Geospace Sciences, \$191 million for Earth Sciences, \$377 million for Ocean Sciences, \$465 million for Polar Programs, and \$94 million for Integrative and Collaborative Education and Research (ICER) within GEO. Much of NSF's geosciences research budget supports investigations that are critical for current national needs, such as water and mineral resources, energy resources, environmental issues, climate change, and mitigation of natural hazards.

GEO supports infrastructure and operation and maintenance costs for cutting-edge facilities that are essential for basic and applied research. Ultimately, the observations and data provide knowledge that is used by researchers and professionals in both the public and private sectors. GEO research and infrastructure help drive economic growth in a sustainable manner. Geoscience-based research tools and academic expertise helped to end the BP Deepwater Horizon oil spill, saving billions of dollars for industry and untold costs to the environment.

Within GEO, Polar Programs (PLR) funds basic research in the Arctic and Antarctica that helps the United States maintain strategic plans, international efforts, security goals, natural resource assessments, cutting-edge polar technology developments, and environmental stewardship of extreme environs. PLR's funding helps support researchers and students, the U.S. military, and the private sector. PLR is estimated to directly support more than 3,000 people in fiscal year 2014 and thousands of others indirectly.

AGI strongly supports robust and steady funding for infrastructure and operation and maintenance of GEO's major facilities, including the Academic Research Fleet, Seismological Facilities for the Advancement of Geosciences and EarthScope (SAGE), Geodetic Facilities for the Advancement of Geoscience and EarthScope (GAGE), International Ocean Discovery Program (IODP), the Ocean Observatories Initiative, and the National Center for Atmospheric Research (NCAR).

NSF Support for Earth Science Education.—Congress can grow the depleted geosciences workforce; stimulate economic growth in the energy, natural resources and environmental sectors; and improve natural resource literacy by supporting the full integration of Earth science information into mainstream science education at the K–12 and higher education levels. AGI strongly supports the Math and Science Partnerships (MSP), the Graduate Research Fellowship Program (GRFP), and the Research Experiences for Undergraduates (REU) within NSF's Education and Human Resources (EHR) Division. These programs are effective in building a science and engineering workforce for the 21st century.

Improving geoscience education, one of the goals of NSF-EHR, to levels of recognition similar to other scientific disciplines is important in the following ways:

- Geoscience offers students subject matter that has direct application to their lives and the world around them, including energy, minerals, water, and environmental stewardship. All students should be required to take a geoscience course in primary and secondary school.
- Geoscience exposes students to a range of interrelated scientific disciplines. It is an excellent vehicle for integrating the theories and methods of chemistry, physics, biology, and mathematics. A robust geoscience course would make an excellent capstone for applying lessons learned from earlier class work.
- Geoscience awareness is a key element in reducing the impact of natural hazards on citizens—hazards that include earthquakes, volcanic eruptions, hurricanes, tornadoes, and floods. Informal geoscience education that leads to reducing risks and preparing for natural events should be a life-long goal.
- Geoscience provides the foundation for tomorrow's leaders in research, education, utilization, and policy making for Earth's resources and our nation's strategic, economic, sustainable, and environmentally sound natural resources development. There are not enough U.S.-trained geoscientists to meet current demand and the gap is growing, as shown in the recent National Academies report, Emerging Workforce Trends in the U.S. Energy and Mining Industries: A Call to Action. Support for geoscience research and education is necessary to stay competitive and to wisely manage our natural resources.

NOAA.—AGI supports the President's request for \$5.45 billion for NOAA. We hope the Subcommittee will continue to support the National Weather Service

(NWS), Oceanic and Atmospheric Research (OAR), National Ocean Service (NOS), and the National Environment Satellite, Data and Information Service (NESDIS). These programs are critical for understanding and mitigating natural and human-induced hazards in the Earth system while sustaining our natural resources. These programs prevent billions of dollars of losses, keep the private and public sectors growing, and save lives. For example, drought forecasts are worth up to \$8 billion to the farming, transportation, tourism, and energy sectors while NexRad radar has prevented more than 330 fatalities and 7,800 injuries from tornadoes since the early 1990s.

NIST.—We support the President's request for \$928 million for NIST in fiscal year 2014. Basic research at NIST is conducted by Earth scientists and geotechnical engineers and used by the public and private sectors on a daily basis. The research conducted and the information gained are essential for understanding natural hazards and for identifying the infrastructure needed to build resilient communities and stimulate economic growth. Advanced infrastructure research will help to reduce the estimated average of \$52 billion in annual losses caused by floods, fires, and earthquakes.

NIST is the lead agency for the National Earthquake Hazard Reduction Program (NEHRP), but has received only a small portion of authorized and essential funding in the past. AGI strongly supports the reauthorization of the National Earthquake Hazards Reduction Program (NEHRP) in this Congress. We hope the appropriations subcommittee will continue to support this effective and cohesive program, even if the authorizing legislation takes more time to complete. NEHRP is an excellent example of how to coordinate different entities for the safety and security of all. NEHRP develops effective practices and policies for earthquake loss reduction and accelerates their implementation; improves techniques for reducing earthquake vulnerabilities of facilities and systems; improves earthquake hazards identification and risk assessment methods and their use; and improves the understanding of earthquakes and their effects.

NASA.—AGI supports the vital Earth observing programs within NASA. AGI supports funding of \$1.85 billion for Earth Science programs within the Science Mission Directorate at NASA. The investments are needed to implement the priorities of the National Academies Earth Science and Applications from Space Decadal Survey. NASA needs to maintain its current fleet of Earth-observing satellites, launch the next tier and accelerate development of the subsequent tier of missions. The observations and understanding about our dynamic Earth gained from these missions are critical and needed as soon as possible. Earth observations are used every day, not just for research, but for critical information to aid society in mundane tasks, like weather forecasting and emergency services, such as tracking volcanic ash plumes or oil spills that disrupt the economy and the environment.

We applaud the successful launch and ongoing operational testing of the NASA-U.S. Geological Survey Landsat Data Continuity Mission. This program, soon to be renamed Landsat 8, will continue the 40-year Landsat record of land imaging and we support requested funding of \$2.2 million for this mission. We also strongly support the newly created Land Imaging project, which will develop new capabilities to continue and extend Landsat records. Please support the President's request for \$30 million for the initial phase of Land Imaging.

We appreciate this opportunity to provide testimony to the Subcommittee and would be pleased to answer any questions or to provide additional information for the record.

PREPARED STATEMENT OF THE AMERICAN GEOPHYSICAL UNION

The American Geophysical Union (AGU), a non-profit, non-partisan scientific society, appreciates the opportunity to submit testimony regarding the fiscal year 2014 budget request for the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the National Science Foundation (NSF). The AGU, on behalf of its over 62,000 Earth and space scientist members, would like to respectfully request that Congress appropriates at least fiscal year 2012 enacted levels of \$1.761 billion for Earth Science at NASA, \$580.59 billion overall for NOAA, and \$7.033 billion overall for NSF.

NATIONAL SCIENCE FOUNDATION

AGU supports an overall budget of at least \$7.033 billion for NSF. AGU greatly appreciates Congress's support for science and technology in past appropriations and through the America COMPETES Reauthorization Act of 2010. Investments in NSF provide for America's future in a responsible manner. These investments pay

out vitally important dividends in future development that drives economic growth, especially in critical areas of sustainable and economic natural resources and reduced risks from natural hazards. Support for science will maintain our economic and industrial leadership in the global marketplace, ensure economic progress, grow jobs, and uphold society's advancement.

Geosciences Directorate

AGU requests \$885.27 million for the Geosciences Directorate (GEO), the principal source of Federal support for academic Earth scientists and their students who are seeking to understand the processes that sustain and transform life on this planet. Approximately 63 percent of support for university-based geosciences research comes from this directorate and more than 14,000 people will be directly supported through GEO in fiscal year 2014 with thousands of others deriving support indirectly.

Much of the geosciences research budget leads to a better understanding of critical national needs, such as water and mineral resources, energy resources, environmental issues, climate change, and mitigation of natural hazards. AGU asks the Subcommittee to strongly support these programs.

GEO supports infrastructure, operation, and maintenance costs for cutting edge facilities that are essential for basic and applied research. Geoscience-based research tools and academic expertise helped to end the BP Deepwater Horizon oil spill, saving billions of dollars for industry and untold costs to the environment. Among the major facilities that NSF supports, the Academic Research Fleet, EarthScope Operations, Incorporated Research Institutions for Seismology (IRIS), Ocean Drilling Activities, the Ocean Observatories Initiative, and the National Center for Atmospheric Research are all key to our nation's innovation and economic well-being. AGU strongly supports robust and steady funding for this infrastructure as well as operation and maintenance of these major facilities.

Earth Science Education

The geosciences workforce is aging and being quickly depleted. Congress can grow this workforce, stimulate economic growth in the energy, natural resources and environmental sectors, and improve natural resource literacy by supporting the full integration of Earth science information into mainstream science education at the K-12 and higher education levels. AGU strongly supports the Math and Science Partnerships (MSP), the Graduate Research Fellowships (GRF) and the Research Experiences for Undergraduates (REU) within NSF's Education and Human Resources Division. These programs are effective in building a science and engineering workforce for the twenty-first century. Improving geoscience education, one of the goals of NSF-EHR, to levels of recognition similar to other scientific disciplines is critical.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Joint Polar Satellite System (JPSS)

AGU supports fully funding JPSS in fiscal year 2014. Because the fiscal year 2011 funds that were necessary to launch JPSS on time were not appropriated, there will be a data gap beginning in 2017. It is critical that Congress sufficient funds for JPSS in fiscal year 2014 in order to minimize the length of that gap.

Polar satellites provide the only weather and climate information for large portions of the planet and are particularly important for a whole host of end users. For military planners, overseas U.S. military operations will be greatly affected by the data gap. JPSS will provide critical information for long-term forecasts, which are imperative for troop deployments and planning operations. Additionally, weather forecasts for oil and gas companies doing work in Alaska, as well as cargo and cruise ships carrying billions of dollars worth of goods and millions of passengers, will be compromised. Furthermore, our ability to forecast weather in Alaska will be severely compromised. Others impacted by a data gap include the aviation industry, as JPSS will observe volcanic eruptions and track the movement of ash clouds; agriculture, as farmers rely on polar satellites for drought, extreme temperature, and length of growing season information; the fishing industry, as fishermen check sea-surface data from polar satellites to find fish stocks before heading out for their daily catch; and finally weather forecasting, as forecasters' ability to accurately project the intensity and trajectory of severe weather events, such as hurricanes, will be greatly diminished.

National Weather Service (NWS)

AGU hopes the Subcommittee will continue to support NWS and will fund it at the fiscal year 2012 enacted level of \$972 million in fiscal year 2014. NWS is critical to protecting American lives, property, and commerce. Weather observations provide

information that is vital for weather modeling and functions like accurate tornado watches and warnings and storm forecasting must be preserved. Furthermore, buoy and surface weather observations are the backbone of most of the weather warning systems. Because at least one-third of U.S. GDP is concentrated in weather-sensitive industries, it is critical that Congress maintains the United States' robust weather forecasting infrastructure.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Earth Science

AGU supports the vital Earth observing programs within NASA. AGU supports the fiscal year 2012 enacted level of \$1.761 billion for Earth Science programs within the Science Mission Directorate at NASA. The investments are needed to implement the priorities of the National Academies Earth Science and Applications from Space Decadal Survey. NASA needs to maintain its current fleet of Earth-observing satellites, launch the next tier, and accelerate development of the subsequent tier of missions. The observations and understanding about our dynamic Earth gained from these missions is critical and needed as soon as possible. Earth observations are used every day, not just for research, but for critical information to aid society in routine tasks, such as weather forecasting, emergency services, and tracking volcanic ash plumes or oil spills that disrupt the economy and the environment.

Planetary Science

AGU supports the fiscal year 2012 enacted levels of \$1.501 billion for the Planetary Science programs within the Science Mission Directorate at NASA. Planetary science examines the origin, content, and evolution of the solar system and the potential for life elsewhere. There are more practical applications for planetary sciences as well. The science data from many planetary missions provides scientists with critical information for future human spaceflight missions, which furthers NASA's exploration agenda. Additionally, Robotic Mars orbiters are mapping natural resources such as water and minerals on Mars.

AGU appreciates this opportunity to provide testimony to the Subcommittee and would be pleased to answer any questions or to provide additional information for the record. We thank you for your thoughtful consideration of our request. For additional information, please contact Elizabeth Landau at the American Geophysical Union.

PREPARED STATEMENT OF THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

The American Institute of Biological Sciences (AIBS) appreciates the opportunity to provide testimony in support of fiscal year 2014 appropriations for the National Science Foundation (NSF). We encourage Congress to provide NSF with at least \$7.626 billion in fiscal year 2014.

The AIBS is a nonprofit scientific association dedicated to advancing biological research and education for the welfare of society. AIBS works to ensure that the public, legislators, funders, and the community of biologists have access to and use information that will guide them in making informed decisions about matters that require biological knowledge. Founded in 1947 as a part of the National Academy of Sciences, AIBS became an independent, member-governed organization in the 1950s. Today, AIBS has nearly 160 member organizations and is headquartered in Reston, Virginia, with a Public Policy Office in Washington, DC.

NSF AND INNOVATION

The NSF is an important engine that helps power our nation's economic growth. Through its competitive, peer-reviewed research grants, NSF supports the development of new knowledge that will help to solve the most challenging problems facing society, and will lead to new scientific discoveries, patents, and jobs. The agency's education and training programs are helping to ensure that the next generation has the scientific, technical, and mathematical skills employers are seeking. Investments in research equipment and facilities enable the country to continue to innovate and compete globally.

These efforts, however, require a sustained Federal investment. Unpredictable swings in Federal funding can disrupt research programs, create uncertainty in the research community, and stall the development of the next great idea.

NSF is a sound investment that pays dividends. The use of peer-review to evaluate and select the best proposals means that NSF is funding the highest quality research.

The research supported by NSF is unique from the science funded by other Federal programs. Unlike most Federal agencies, which focus on applied research, NSF supports basic research that advances the frontiers of our knowledge about biodiversity, genetics, physiology, and ecosystems. Recent discoveries that stem from NSF-funded research include:

- Development of a robotic fish that mimics live fish behavior. The robot could be used to lead schools of real fish away from dangers such as turbines or oil spills.
- Identification of the mechanisms that keep natural structures, like plant leaves and butterfly wings, clean. This information could be used to prevent fouling of human-made structures.
- Calculation of the impact of bark beetle infestations on a forest's ability to store carbon dioxide. This new method can also be used to assess other economic impacts of forest loss.
- Discovery of the key proteins and enzymes in an insect's outer shell, and identification of which proteins break down easily. These insights could be used to create more effective pest control strategies.

BIOLOGICAL SCIENCES DIRECTORATE

The NSF is the primary Federal funding source for basic biological research at our nation's universities and colleges. The NSF provides approximately 64 percent of extramural Federal support for non-medical, fundamental biological and environmental research at academic institutions.

The Biological Sciences Directorate (BIO) funds research in the foundational disciplines within biology. These fields of study further our understanding of how organisms and ecosystems function. Additionally, BIO supports innovative interdisciplinary research that improves our understanding of how human social systems influence—or are influenced by—the environment, such as the NSF-wide Science, Engineering, and Education for Sustainability program. In collaboration with NSF's engineering and math and physical sciences directorates, BIO is working to develop new, cutting-edge research fields. For example, the BioMaPS program is accelerating understanding of biological systems, and applying that knowledge to new technologies in clean energy.

Equally important, BIO provides essential support for our nation's place-based biological research, such as field stations and natural science collections. The Long-Term Ecological Research program supports fundamental ecological research over long time periods and large spatial scales, the results of which provide information necessary for the identification and resolution of environmental problems.

The fiscal year 2014 budget request would also sustain an effort to digitize high priority specimens in U.S. natural science collections. This investment will help the scientific community ensure access to and appropriate curation of irreplaceable biological specimens and associated data, and stimulate the development of new computer hardware and software, digitization technologies, and database management tools.

The Dimensions of Biodiversity program supports cross-disciplinary research to describe and understand the scope and role of life on Earth. Despite centuries of discovery, most of our planet's biodiversity remains unknown. This lack of knowledge is particularly troubling given the rapid and permanent loss of global biodiversity. A better understanding of life on Earth will help us to make new bio-based discoveries in the realms of food, fiber, fuel, pharmaceuticals, and bio-inspired innovation.

The Major Research Equipment and Facilities Construction account is funding the construction of the National Ecological Observatory Network (NEON). Once completed, NEON will provide the infrastructure necessary to collect data across the United States on the effects of climate change, land use change, water use, and invasive species on natural resources and biodiversity. This information will be valuable to scientists, resource managers, and government decision makers as they seek to better understand and manage natural systems.

STEM EDUCATION

NSF plays a central role in science, technology, engineering, and mathematics (STEM) education. Support for the scientific training of undergraduate and graduate students is critically important to our research enterprise. Students recruited into science through NSF programs and research experiences are our next generation of innovators and educators. In short, NSF grants are essential to the nation's goal of sustaining our global leadership in science, technology, engineering and mathematics, and reigniting our economic engines.

NSF's education initiatives support STEM education innovation from elementary school through post-graduate. The Graduate Research Fellowship program is an important part of our national effort to recruit and retain the best and brightest STEM students. The Faculty Early Career Development program (CAREER) supports young faculty who are dedicated to integrating research with teaching and learning.

Major changes to STEM education programs are proposed in the NSF fiscal year 2014 budget request. We appreciate the need for efficient and effective government programs, especially in light of the current fiscal situation. We are concerned, however, that implementation of these changes will proceed before the full details are known. Given the considerable consequences for student education and training, we hope that Congress will provide careful consideration of the potential impacts to our nation's pipeline of researchers and STEM-skilled workers.

CONCLUSION

Continued investments in the biological sciences are critical. Sustained support for NSF will help spur economic growth and innovation, and continue to build scientific capacity at a time when our nation is at risk of being outpaced by our global competitors. Please support an investment of at least \$7.626 billion for NSF for fiscal year 2014.

Thank you for your thoughtful consideration of this request and for your prior efforts on behalf of science and the National Science Foundation.

PREPARED STATEMENT OF THE AMERICAN INDIAN HIGHER EDUCATION CONSORTIUM

This statement focuses on the National Science Foundation (NSF) and National Aeronautics and Space Administration (NASA).

On behalf of this nation's 37 Tribal Colleges and Universities (TCUs), which collectively are the American Indian Higher Education Consortium (AIHEC), thank you for the opportunity to express our views and recommendations regarding the Tribal Colleges and Universities' Programs with the National Science Foundation (NSF—TCUP) and National Aeronautics and Space Administration (NASA—TCUP) for fiscal year 2014.

SUMMARY OF REQUESTS

National Science Foundation (NSF)—Education and Human Resources Directorate (EHR).—Since fiscal year 2001, a TCU initiative has been funded and administered under the NSF—EHR. This competitive grants program enables TCUs to enhance the quality of their science, technology, engineering, and mathematics (STEM) instructional, research, and outreach programs. TCUs that have been awarded an NSF—TCUP grant have completed comprehensive institutional needs analysis and developed a plan for how to address both their institutional and NSF goals, with a primary institutional goal being significant and sustainable expansion and improvements to STEM programs. Through NSF—TCUP, Tribal Colleges and Universities have been able to establish and maintain programs that represent a key component of the pipeline for the American Indian STEM workforce. We urge the Subcommittee to fund the NSF—TCU competitive grants program at a minimum of \$13,350,000.

National Aeronautics and Space Administration (NASA)—NASA Headquarters, Office of Education—Minority University Research and Education Programs.—The NASA—TCUP offers competitive grants to enhance the range of education and research opportunities in STEM areas at the nation's TCUs. Programs and activities funded under this vital program help to address the science education and research needs of TCUs and help in building the Native (and national) STEM workforce, and enhance the economic development of the communities they serve. We strongly urge the Subcommittee to fund the NASA—TCU grants program at the fiscal year 2010 level.

TCU SHOESTRING BUDGETS: "DOING SO MUCH WITH SO LITTLE"

Tribal Colleges and Universities are an essential component of American Indian/Alaska Native (AI/AN) education. Currently there are 37 TCUs operating more than 75 campuses and sites in 15 States, within whose geographic boundaries 80 percent of American Indian reservations and Federal Indian trust land lie. They serve students from well over 250 federally recognized tribes, more than 75 percent of whom are eligible to receive Federal financial aid. In total, the TCUs annually serve about 88,000 AI/ANs through a wide variety of academic and community-based programs. TCUs are accredited by independent, regional accreditation agencies and like all

U.S. institutions of higher education must undergo stringent performance reviews on a periodic basis to retain their accreditation status. Each TCU is committed to improving the lives of its students through higher education and to moving American Indians toward self-sufficiency.

To do this, TCUs must fulfill additional roles within their respective reservation communities functioning as community centers, libraries, tribal archives, career and business centers, economic development centers, public meeting places, and child and elder care centers.

TCUs have advanced AI/AN higher education significantly since we first began four decades ago, but many challenges remain. Tribal Colleges and Universities are perennially underfunded, and remain some of the most poorly funded institutions of higher education in the country.

The tribal governments that have chartered TCUs are not among the handful of wealthy gaming tribes located near major urban areas and highlighted in the mainstream media. Rather, they are some of the poorest governments in the country. Tribal Colleges and Universities are home to some of the most disadvantaged countries in America.

The Federal Government, despite its direct trust responsibility and treaty obligations, has never fully funded the TCUs' institutional operating budgets, authorized under the Tribally Controlled Colleges and Universities Assistance Act of 1978. Currently, the Administration requests and Congress appropriates over \$200 million annually, towards the institutional operations of Howard University (exclusive of its medical school), the only other MSI that receives institutional operations funding from the Federal Government. Howard University's current Federal operating support exceeds \$19,000/student. In contrast, most TCUs are receiving \$5,665 per Indian Student (ISC) under the Tribal College Act, about 70 percent of the authorized level. TCUs have proven that they need and have earned an investment equal to—at the very least—the congressionally authorized level of \$8,000/Indian student, which is only 42 percent of the Federal share now appropriated for operating Howard University. It is important to note that although about 17 percent of the TCUs' collective enrollments are non-Indian students living in the local community, TCUs only receive Federal funding based on Indian students, which are defined as members of a federally recognized tribe or a biological child of a tribal member. Please understand that we are by no means suggesting that our sister MSI, Howard University does not need or deserve the funding it receives, only that the TCUs also need and deserve adequate institutional operations funding; however, their operating budgets remain grossly underfunded.

While TCUs do seek funding from their respective State legislatures for their students that are non-Indian State-residents (sometimes referred to as “non-beneficiary” students) successes have been at best inconsistent. TCUs are accredited by the same regional agencies that accredit mainstream institutions, yet they have to continually advocate for basic operating support for their non-Indian State students within their respective State legislatures. If these non-beneficiary students attended any other public institution in the State, the State would provide that institution with ongoing funding toward its day-to-day operations. Given their locations, often hundreds of miles from another postsecondary institution, TCUs remain open to all students, Indian and non-Indian, believing that education in general, and postsecondary education in particular is the silver bullet to a better economic future for their regions.

TCUs effectively blend traditional teachings with conventional postsecondary curricula. They have developed innovative ways to address the needs of tribal populations and are overcoming long-standing barriers to success in higher education for American Indians. Since the first TCU was established on the Navajo Nation in 1968, these vital institutions have come to represent the most significant development in the history of Tribal higher education, providing access to, and promoting achievement among students who might otherwise never have known postsecondary education success.

JUSTIFICATIONS

National Science Foundation/Tribal Colleges and Universities Program (NSF—TCUP) in the Education and Human Resources Directorate.—American Indian students have the highest high school drop-out rates in the country. On average, more than 75 percent of all TCU students must take at least one developmental course, most often precollege mathematics. Of these students, our data indicate that many do not successfully complete the course in 1 year. Without question, a large proportion of the TCUs' already limited resources is dedicated to addressing the perennial failings of K-12 education systems.

To help rectify this, TCUs have developed strong partnerships with their local K–12 feeder schools and are actively working, in large part through support from NSF–TCU grant programs, to engage young students in community and culturally relevant science and math education and outreach programs. These efforts include weekend academies and summer STEM camps that reinforce and supplement the instructional programs area K–12 schools are able to provide.

Beginning in fiscal year 2001, NSF–TCUP has provided essential capacity building assistance and resources to TCUs. In the years since the program began, NSF–TCUP has become the primary Federal program for building STEM capacity at the TCUs. NSF–TCUP has served as a catalyst for capacity building and positive change at TCUs and the program can be credited with many success stories. Today, American Indians and Alaska Natives are more aware of the importance of STEM to their long-term survival, particularly in areas such as renewable energy and technology-driven economic development.

The NSF–TCU program, administered by the Education and Human Resources Directorate, is a competitive grants program that enables TCUs to develop and expand critically needed science and math education and research programs relevant to their respective communities. Through this program, TCUs that have been awarded an NSF–TCUP grant have been able to enhance their STEM instructional offerings, workforce development, research, and outreach programs.

For example, College of Menominee Nation (CMN) in Keshena, WI has established strong programs in Pre-engineering, Computer Science, Natural Resources, the Biological and Physical Sciences, and Sustainable Development primarily through support from NSF–TCUP. CMN's Sustainable Development Institute now hosts regional and sometimes international conferences on sustainable practices and in 2011 hosted an important conference for tribes located in the Great Lakes region to review current research on, and discuss strategies for responding to, emerging challenges attributed to climate change. CMN is an example of how TCUs are using their STEM programs as a springboard for taking critical leadership roles within their communities. Additionally, faculty and students at Haskell Indian Nations University in Lawrence, KS are using the university's Sequoyah Computer and GIS Lab to support their work with the Omaha and Winnebago Tribal Nations in collecting and analyzing hydrologic and botanical data necessary to support resource management decisionmaking by the tribal leadership.

Unfortunately, not all of the TCUs have had an opportunity to benefit from this dynamic program; yet, funding for this program has been static, and the percentage of proposals funded has declined each year beginning in 2004. We strongly urge the Subcommittee to fund the NSF–TCU grants program at a minimum of \$13,350,000.

National Aeronautics and Space Administration (NASA)—Tribal Colleges and Universities Program (NASA—TCUP) in the NASA Headquarters, Office of Education—Minority University Research and Education Programs.—Since 2010, Navajo Technical College (NTC) in Crownpoint, NM, has conducted an extremely successful program initiated through and funded under a three year NASA—TCUP grant to the American Indian Higher Education Consortium (AIHEC) entitled: Launching Undergraduate Native Americans in Research, Education, and Employment or AIHEC—LUNAR-e. NTC through a partnership with NASA's Marshall Space Flight Center in Huntsville, AL not only offers students unparalleled real world science research experience at NASA Centers but has created a model for fostering long-term relationships between TCUs and NASA Centers. Building on this initial grant, NTC has developed an innovative degree program in digital technology, which is providing an incubator for developing new American Indian-owned digital technology businesses that in turn will foster economic development of Tribal communities. We strongly urge the Subcommittee to fund the NASA—TCU grants program at the fiscal year 2010 level.

CONCLUSION

Tribal Colleges and Universities provide access to quality higher education opportunities, including STEM focused programs, for thousands of American Indians. The modest Federal investment that has been made in TCUs has paid great dividends in terms of employment, education, and economic development. Continuation of this investment represents one of the most cost-effective strategies for enabling Tribal (and national) STEM-based economic development, and makes sound moral and fiscal sense.

We greatly appreciate your past and continued support of the Tribal Colleges and Universities and your serious consideration of our fiscal year 2014 appropriation requests.

**PREPARED STATEMENT OF THE ASSOCIATION OF PUBLIC AND LAND-GRANT
UNIVERSITIES' BOARD ON OCEANS, ATMOSPHERE, AND CLIMATE**

On behalf of the Association of Public and Land-grant Universities' (APLU's) Board on Oceans, Atmosphere, and Climate (BOAC), we thank you for the opportunity to provide support of and recommendations for the proposed fiscal year 2014 budgets for the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautic and Space Administration (NASA) and the National Science Foundation (NSF). BOAC represents over 300 scientists and administrators at APLU's 218 member universities and systems. We support the administration's budget request of \$5.447 billion for NOAA, \$17.715 billion for NASA and \$7.6 billion for NSF. In general, APLU supports the Administration's attention to STEM education and its importance. Within the NOAA budget, however, we do not support the termination of the \$4 million in STEM education activities within Sea Grant.

As external partners, we help these agencies fulfill their mission to ensure homeland security, maintain global communications, increase economic vitality, and inform the public of atmospheric and marine ecological health threats. To fulfill these missions, the nation depends upon reliable science.

About \$3 trillion or one-third of the U.S. economy, including industries as diverse as agriculture, finance, energy, insurance, transportation, real estate and outdoor recreation, is highly weather- and seasonal climate-sensitive. It was estimated that all weather combined can produce a variation in the gross domestic product of 3.4 percent or \$485 in 2008 dollars, the year studied. Extreme weather events, like tornadoes, hurricanes, oppressive heat, heavy precipitation both wet and frozen, catastrophic floods, dust storms and drought, clearly demonstrate both the immediate and long-term impacts that weather and seasonal climate can have on a region. In 2012, the U.S. had no less than 11-billion-dollar-plus events including: Hurricane Sandy (\$62 billion), 2012 drought (\$35 billion and counting), March 2-3 tornado outbreak (\$4 billion), June 29 Derecho (\$3.75 billion), and Hurricane Isaac (\$2 billion).

Environmental data collected and distributed by NASA, NSF and NOAA represent a national resource used not only by universities for research, education and outreach, but also by private industry to produce the products and services utilized by the energy, transportation, public utility, water, recreation resource, food, insurance, homeland security and other sectors of the Nation, all of which contribute to the economic vitality of the country and the well-being of the citizenry.

In order to address the nation's needs, we need to ensure:

- A robust observing system, as described by the NRC's 2009 report, "Observing Weather and Climate from the Ground Up, a Nationwide Network of Networks";
- Forecast and predictive capability for the nation;
- Robust extramural funding to leverage the talents of the nation and to ensure the education of future scientists; and
- Outreach to help translate the science into actionable items for communities.

Currently, some of these systems are being damaged by the on-going sequester. Furthermore, based on the caps put in place in the Budget Control Act of 2011, discretionary spending is poised to bear the brunt of cuts for the next decade. A slow bleeding of our nation's science agencies will leave our nation poorly prepared for a changing world and unable to create the technological innovations needed for future challenges. Forecasting the onset, duration and effects of solar storms, atmospheric weather events, coastal storms, floods and storm surges, sea-level variability, toxic algal blooms, and seasonal climate conditions depends on sustained funding of the science and technology. As your committee faces the incredibly difficult task of deciding where to spend its dollars, please consider the life-saving technologies (Doppler radar and its upgrades, 7 day warnings for hurricanes) developed from past investments in science by Congress and what technologies may come next from investment by this Congress.

NOAA, NASA and NSF each play unique roles in a number of high-priority U.S. and international initiatives. All three agencies also support research at our member institutions that provides critical information to policymakers and communities across the country, as well as advances U.S. science and technology through strong collaboration with these agencies.

Below we comment on the needs of each agency and their collaborating science communities:

NOAA

NOAA provides important services to all Americans, services that are vital to our economy, national security, surface, marine and air transportation, human safety and the health of human and marine ecological systems.

Of ongoing concern is the need for increased and sustained support of satellite and in situ environmental observing systems. As reported in several prior and recent National Research Council studies (*Observing Weather and Climate from the Ground Up, a Nationwide Network of Networks*, NRC, 2009), the needs are particularly acute for urbanized areas as well as mountain, ocean and coastal regions. Vertical profiles of variables such as water vapor, winds, and temperatures are virtually non-existent over land and are non-existent over water. Over land, the primary recommendation is for the placement of vertical profilers, vertically pointing radars, acoustic sounders and lidars that collect vertical observations of wind and temperature from the ground up through the lower atmosphere.

While we recommend sustained support for NOAA's satellite programs, we point out that this support should not be at the expense of NOAA's extramural funding of research, education and outreach. Extramural funding is cost effective. Its highly competitive nature ensures up-to-date qualifications and cutting-edge approaches without the continuing costs of developing, maintaining and updating these skills in house. It provides essential training in research skills to provide the next generation of researchers. In 2004 the NOAA Science Advisory Board's Research Review Team report concluded:

". . . Extramural research is critical to accomplishing NOAA's mission. NOAA benefits from extramural research in many ways, including: access to world class expertise not found in NOAA laboratories; connectivity with planning and conduct of global science; means to leverage external funding sources; facilitate multi-institution cooperation; access to vast and unique research facilities; and access to graduate and undergraduate students. Academic scientists also benefit from working with NOAA, in part by learning to make their research more directly relevant to management and policy. It is an important two-way street . . . NOAA cannot accomplish its goals without the extramural community, specifically the universities and institutions that represent the broad range of expertise and resources across the physical, biological, and social sciences (emphasis added). Moreover, there is the important issue of maintaining a scientific and technologically competent workforce in NOAA and the workforce is another "product" of the extramural research community . . . Also it is important that during difficult budget periods that NOAA not disproportionately target the extramural research for budget cuts."

NOAA's support of environmental research and education via Cooperative Institutes and programs such as the Oceanic and Atmospheric Research's Sea Grant and the Office of Ocean Exploration and Research programs are critical to university research, education and outreach. Similarly, NOAA's role in understanding the oceans and coastal areas and oceanic resources through the National Centers for Coastal Ocean Science support and help maintain sustainable coastal economies.

While we are highly supportive of the Administration's request of \$72.7 million for the National Sea Grant College Program, we do not support the Administration's request to terminate the Sea Grant Knauss Fellowship Program or the Sea Grant-NOAA Fisheries Fellowship Program. Though we appreciate the Administration's attention to STEM education, we believe these particular programs serve a focused need by a focused scientific community that engage NOAA. Terminating these programs and expecting a more generic program to pick up the slack would likely lose the attention given to building the STEM workforce in fisheries and ocean and coastal sciences.

NASA

In 2007, the National Academies issued the report, "Earth and Science Applications from Space: National Imperatives for the Next Decade and Beyond." The report found that between 2000 and 2009 funding for Earth Sciences (ES) had fallen substantially. ES research is absolutely critical to understanding climate change, such as the decline of Earth's ice sheets and the health of the global oceans. For this reason, BOAC is heartened by the Administration's request for NASA's expanded and enhanced science mission. Past investments in NASA's science mission have funded university research that has resulted in the development of new instruments and technologies and in valuable advances in weather forecasting, climate projections and understanding of Earth ecosystems.

NASA is instrumental in deploying satellites used by NOAA and in cooperating with other countries. Furthermore, without the tools developed at NASA, oceanic, atmospheric, hydrologic and earth-system scientists and the nation would have only a fragmentary picture of the interconnected functioning of the planet's oceans, atmosphere and land. NASA plays a role in technology transfer from NOAA by testing new sensors. NASA is currently developing a sensor that will for the first time give

scientists and resource planners a global picture of the world's terrestrial water supplies. Currently many lakes and rivers are not monitored and there is no centralized location for water resource information. The NASA data archive is an irreplaceable collection of environmental information that researchers depend upon. Furthermore, through its support for young scientists and graduate students, the NASA science mission supports innovation.

Finally, we support funding NASA to develop and implement a scatterometer mission with fast community access to those data, capability to distinguish between wind and rain and a higher orbit for coverage of Alaskan waters. The scatterometer has been a critical component of hurricane prediction.

NSF

BOAC supports funding of NSF, which is critical to U.S. basic research. NSF supplies almost two-thirds of all Federal funding for university-based, fundamental research in the geosciences. GEO-supported research increases our ability to understand, forecast, respond to and prepare for environmental events and changes. NSF's Water Sustainability and Climate program addresses the pressing challenge of providing adequate water quantity and quality in light of both burgeoning human needs and increasing climate variability and change. Through facilities such as the Oceans Observatory Initiative, the Integrated Ocean Drilling Program, and NCAR-Wyoming supercomputer, NSF provides the academic community with advanced capabilities that it would not be able to afford if conducted through individual institutions. It does so without growing the needs for increased personnel, training and re-tooling in house at Federal laboratories and while training the next generation.

The National Center for Atmospheric Research (NCAR), based in Boulder Colorado, is a federally Funded Research and Development Center (FFRDC) of the National Science Foundation, managed by the University Corporation for Atmospheric Research (UCAR). It is funded out of the Atmospheric and Geospace Sciences Division of the Geosciences Directorate. NCAR performs research that positively affects the economy and saves lives. The laboratory makes weather forecasts more accurate, enables better prediction of severe storms, including tornadoes and hurricanes, and manages climate computer models that inform stakeholder decisions regarding agriculture, water resource management, transportation, and energy resources. It extends the atmospheric sciences research capabilities of the nation's universities through management of weather and climate observing platforms such as research aircraft, radars, and satellites. The laboratory provides computing capacity to this broad community through the NCAR-Wyoming Supercomputing Center (NWSC), opening this year.

SUMMARY

Together, NOAA, NASA, and NSF provide critical earth observations and research funding for scientists, engineers and mathematicians working to increase understanding of natural phenomena of economic and human significance. BOAC thanks the Committee for its continued support of these critical agencies.

PREPARED STATEMENT OF THE AMERICAN SOCIETY FOR MICROBIOLOGY

The American Society for Microbiology (ASM) is pleased to submit the following testimony on the fiscal year 2014 appropriation for the National Science Foundation (NSF). The ASM is the largest single life science organization in the world with more than 37,000 members.

The National Science Foundation supports fundamental research and education across all fields of science and engineering. There is no doubt that NSF funded research contributes greatly to the Nation's economic growth and improves quality of life. Since its creation in 1950, the NSF mission has been to promote the progress of science and broadly stimulate discovery and innovation important to human welfare.

NSF provides more than 20 percent of Federal support for basic research at U.S. academic institutions with approximately 11,000 new grant awards per year selected from over 40,000 proposals. Every year, the NSF supports at least 200,000 scientists, engineers, educators and students at universities, laboratories, and research sites throughout the United States and worldwide. NSF resources also fuel the Nation's strategy to elevate K-12 education in science, technology, engineering and mathematics (STEM), toward a science literate public and an expanded technical workforce.

The ASM is concerned about sequestration cuts to the NSF budget. NSF's tradition of expending most of its budget to support extramural projects will inevitably link budget cuts to diminished research throughout the country. We urge Congress to support the NSF fiscal year 2014 budget at the highest level possible.

NSF FUNDING STIMULATES INNOVATION, RESEARCH AND INFRASTRUCTURE

Each year, nearly all of the NSF's appropriation directly supports extramural STEM related activities. In the Agency's fiscal year 2013 budget request, 81 percent was allocated for research and related activities, 12 percent for STEM education and workforce expansion, and 3 percent for major research equipment and infrastructure construction. NSF funding of individual and institutional research collectively empowers the U.S. research enterprise as NSF fulfills strategic goals to: "transform the frontiers and innovate for society."

Most NSF research funding distributed each year supports U.S. academic institutions (77 percent in fiscal year 2013). In a recent funding cycle, NSF's share of Federal funding for basic academic research in the United States included: 48 percent for physical sciences, 39 percent for engineering, 59 percent for environmental sciences, 61 percent for social sciences, 64 percent for mathematics, 64 percent for non NIH biological sciences, and 81 percent for computer sciences. The broad scope of the NSF's mission allows for funding to most of the nation's academic STEM-associated departments, schools, and disciplines. In fiscal year 2011, the NSF awarded 11,200 competitive awards to 1,875 institutions, supporting 276,000 researchers, postdoctoral fellows, trainees, teachers and students.

U.S. industries commercializing STEM discoveries are increasingly reliant on scientists and engineers outside of industry for basic research. Reports like the National Science Board's 2012 "Science and Engineering Indicators" consistently point to the United States' world class universities as incubators for economically valuable technology based products, as well as the dire need for more U.S. students in STEM graduate programs.

Declines in State funding are threatening public university recruitment of top tier faculty and students, research performance and training of new scientists and engineers. According to an NSF report released in September, State per student funding for the Nation's principal public research universities dropped an average of 20 percent between 2002 and 2010, with some States falling as much as 48 percent. NSF has a long tradition of supporting new generations of scientists and engineers. Since 1952, it has awarded 44,000 Graduate Research Fellowships. More than 200 Nobel laureates have benefited from NSF funding and include half of the 2012 winners. The fiscal year 2013 budget request included \$19 million for the NSSF Innovation Corps, among multiple programs to promote research training and careers.

NSF skillfully fosters large scale research that would be impossible without far sighted Federal grant-award mechanisms. For example, the Experimental Program to Stimulate Competitive Research (EPSCoR) infuses economic and intellectual resources into States and funding projects comprising multiple disciplines and institutions. Three fiscal year 2013 examples are Alaska's Adapting to Changing Environments project; Utah's Urban Transitions and Arid-region Hydro-sustainability project; and Wyoming's project to establish a research center on watershed hydrology, geophysics, remote sensing, and computational modeling. NSF support also builds research infrastructure like computational capabilities or multi user facilities such as U.S. Antarctic stations. Last year, NSF became lead agency on the new U.S. Ignite initiative to build, test, and explore next generation networks, to help transform U.S. computing capabilities.

NSF FUNDING EXPANDS FRONTIERS OF SCIENTIFIC KNOWLEDGE

Research in the United States becomes more expensive and complex each year. The NSF recognizes that there is unprecedented potential for innovative results. Boundaries that once defined engineering and science are dissolving into melded disciplines like geobiology and biophysics. Through NSF funding, U.S. researchers explore science, engineering and technology in new ways that might otherwise be ignored. NSF's inclusive vision of basic research includes both the virologist using genetic sequencing in a university laboratory and massive, difficult to resolve issues like nationwide energy needs, fragility of our environment, or recalcitrant infectious diseases.

The NSF supports clinical microbiology related research that offers public health protection, improves environments, technological advances that boost U.S. industry, sustainable energy sources and other benefits. NSF funded projects from the past year offer examples of the contribution to basic research:

- Some bacteria that cause deadly cholera outbreaks can resist the human immune system by changing their surface electrical charge, according to a study reported last year. Based on this newly understood mechanism, the researchers are screening potential antibiotics against the pathogen.
- Scientists described how cytomegaloviruses (CMV) evade host immune defenses with a type of “accelerator circuit” in its DNA that allows the virus to quickly reach optimal numbers within the host cell, but stop short of killing the cell—suggesting approaches to developing new therapies against the virus. CMV infects more than half of adults worldwide and normally lies dormant within those infected.
- University researchers reported how the movement of individual soil bacteria (*Myxococcus xanthus*) is amplified within bacterial colonies to build waves of motion, spreading to engulf their prey. The scientists used computer modeling, followed by time-lapse microscopy, to elucidate the collective wave motion of *M. xanthus*, an organism useful in the growing field of systems biology.
- Scientists have discovered a unique symbiosis between single-celled algae and nitrogen-fixing bacteria in the ocean, with algae essentially replacing missing microbial genes typically responsible for several key metabolic pathways—bacteria provide nitrogen to the algae, algae carbon to the bacteria. Genomic analysis points to a possible model for early evolution of plant organelles like chloroplasts. The unusual bacteria are likely central to global nitrogen cycles.
- Research supported by NSF, the National Institutes of Health (NIH), and the Department of Energy has described how a bacterial plant pathogen (*Pseudomonas syringae*) tricks a host plant with a chemical signal mimicking part of the plant’s immune system, overcoming the host’s defenses by keeping open the plant’s stomata for more bacteria to invade. *P. syringae* causes disease in more than 50 plant species.

NSF excels in its support of collaborative research initiatives like the relatively new Ecology and Evolution of Infectious Disease (EEID) program, a joint effort with NIH and the U.S. Department of Agriculture. Focusing on the dynamics of disease transmission, EEID’s multidisciplinary research already has added to understanding the globalization of infectious disease. Among the latest projects are those investigating how human activity like land-use trends has changed patterns in vector-borne pathogens, such as those responsible for West Nile infection, Lyme disease, and dengue fever. Another will uncover the ecological and socio-economic factors behind antibiotic resistance acquired by infectious disease pathogens, examining interactions among microbes, people, and animals in relatively isolated villages of Tanzania. Other 2012 EEID awardees are studying avian influenza, computer models of disease among marine invertebrates, and leptospirosis in Brazil.

The ASM appreciates the opportunity to submit comments and strongly urges that Congress fund the National Science Foundation at the highest possible level in fiscal year 2014.

PREPARED STATEMENT OF THE AMERICAN SOCIETY OF PLANT BIOLOGISTS

On behalf of the American Society of Plant Biologists (ASPB), we submit this testimony for the official record to support the President’s budget request of \$7.625 billion for the National Science Foundation (NSF) for fiscal year 2014. ASPB and its members recognize the difficult fiscal environment our nation faces, but we believe that sustained investments in scientific research will be a critical step toward economic recovery and continued global competitiveness for our nation.

ASPB would like to thank the Subcommittee for its consideration of this testimony and for its strong support for the research mission of NSF.

ASPB is an organization of some 4,500 professional plant biology researchers, educators, graduate students, and postdoctoral scientists with members across the nation and throughout the world. A strong voice for the global plant science community, our mission—achieved through work in the realms of research, education, and public policy—is to promote the growth and development of plant biology, to encourage and communicate research in plant biology, and to promote the interests and growth of plant scientists in general.

FOOD, FUEL, ENVIRONMENT, AND HEALTH: PLANT BIOLOGY RESEARCH AND AMERICA’S FUTURE

Plants are vital to our very existence. They harvest sunlight, converting it to chemical energy for food and feed; they take up carbon dioxide and produce oxygen; and they are the primary producers on which most life depends. Indeed, plant biology research is making many fundamental contributions in the areas of energy secu-

rity and environmental stewardship; the continued and sustainable development of better foods, fabrics, and building materials; and in the understanding of biological principles that underpin improvements in the health and nutrition of all Americans.

In particular, plant biology is at the interface of numerous scientific breakthroughs. For example, with high throughput experimental approaches facilitating extraordinary syntheses of information that are NSF-supported, plant biologists are using computer science applications to make tremendous strides in our understanding of complex biological systems, ranging from single cells to entire ecosystems. Understanding how plants function ultimately will result in better and more productive crops, new sources of fuel, and the development of better medicines to treat diseases like cancer.

Despite the significant positive impact plants have on our nation's economy and in addressing some of our most urgent challenges, including food and energy security, Federal investments in plant biology research are modest. Still scientists have maximized and leveraged this funding in order to understand the basic function and mechanisms of plants, providing a foundation for vital advances in practical applications in agriculture, health, energy, and the environment.

To address future societal challenges that might be mitigated through investments in plant biology research and to prioritize community research efforts, ASPB organized a two-phase Plant Science Research Summit held in September 2011 and January 2013. With funding from NSF, the U.S. Department of Agriculture, the Department of Energy, and the Howard Hughes Medical Institute, the Summit brought together representatives from across the full spectrum of plant science research to develop a ten-year consensus plan to fill critical gaps in our understanding of plant biology in order to address the grand challenges we face. As a research community, our vision is to create plant systems that are flexible and adaptable to new and existing challenges by increasing the predictive and synthetic abilities of plant biology. In achieving these goals, the plant science research community will make significant contributions to:

- exploring, conserving, and utilizing our natural resources;
- protecting, maintaining, and improving crop productivity; and
- creating new plant-inspired industries.

ASPB expects to publish a report from the Plant Science Research Summit in spring 2013. This report will further detail the plant science community's priorities and the key initiatives needed to address the grand challenges facing the nation.

ROBUST FUNDING FOR THE NATIONAL SCIENCE FOUNDATION

ASPB supports continuing to increase funding for NSF and encourages proportional funding increases across all of the scientific disciplines NSF supports. As scientific research becomes increasingly interdisciplinary with permeable boundaries, a diverse portfolio at NSF is needed to maintain transformational research and innovation.

NSF funding for plant biology specifically enables the scientific community to address cross-cutting research questions that could ultimately solve grand challenges related to a sustainable food supply, energy security, and improved health and nutrition. This notion is reflected in the National Research Council's report *A New Biology for the 21st Century* and the President's Council of Advisors on Science and Technology's (PCAST's) recent report *Agricultural Preparedness* and the United States Agricultural Research Enterprise and it will be addressed comprehensively in the Plant Science Research Summit's report. Additionally, ASPB enthusiastically supports the PCAST report's recommendation that calls for increased funding for NSF for basic science related to the agricultural sciences.

The NSF Directorate for Biological Sciences (BIO) is a critical source of funding for scientific research, providing 62 percent of the Federal support for non-medical basic life sciences research at U.S. academic institutions and beyond. BIO supports research ranging from the molecular and cellular levels to the organismal, ecosystem, and even biosphere levels. These investments continue to have significant pay offs, both in terms of the knowledge directly generated and in deepening collaborations and fostering innovation among communities of scientists.

The Biological Sciences Directorate's Plant Genome Research Program (PGRP) is an excellent example of a high impact program that has laid a strong scientific research foundation for understanding plant genomics as they relate to energy (biofuels), health (nutrition and functional foods), agriculture (impact of changing climates on agronomic ecosystems), and the environment (plants' roles as primary producers in ecosystems). ASPB supports the President's request to increase PGRP by \$4 million as well as to have sustained funding growth over multiple years to address 21st century challenges. Furthermore, in light of the need to create

cyberinfrastructure across a wide range of scientific disciplines, ASPB supports efforts to homogenize metadata formats and enhance data sharing.

Without significant and increased support for BIO and NSF as a whole, promising fundamental research discoveries will be delayed and vital collaborations around the edges of scientific disciplines will be postponed, thus limiting the ability to respond to the pressing scientific problems that exist today and the new challenges on the horizon. Addressing these scientific priorities also helps improve the competitive position of the United States in a global marketplace.

CONTINUED SUPPORT FOR NSF EDUCATION AND WORKFORCE DEVELOPMENT PROGRAMS

The National Science Foundation is a major source of funding for the education and training of the American scientific workforce and for understanding how educational innovations can be most effectively implemented. NSF's education portfolio impacts students at all levels, including K-12, undergraduate, graduate, and post-graduate, as well as the general public.

As NSF embarks upon a new effort to rethink and improve graduate education in the United States, ASPB is supportive of new ideas that will enhance student learning, training, retention, access, and recruitment. Furthermore, ASPB urges the Subcommittee to support the President's request to expand some of NSF's fellowship and career development programs—such as the Graduate Research Fellowship (GRF)—thereby providing continuity in funding opportunities for the country's most promising early career scientists. ASPB also requests continued support for the Postdoctoral Research Fellowships in Biology and the Faculty Early Career Development (CAREER) programs. ASPB further encourages the NSF to develop “transition” awards that will support the most promising scientists in their transition from postdoctoral research to independent, tenure-track positions in America's universities. The NSF might model such awards after those the National Institutes of Health offers.

Furthermore, the nearly seven-year median for a life-science PhD in the United States contrasts with other nations where students specialize earlier, thus entering doctoral programs with more uniform and advanced scientific foundations. To focus more attention on new types of skills, such as private-sector experience and data-science training, NSF may wish to consider encouraging universities to tailor undergraduate curricula to allow committed students to enter PhD programs without needing a significant amount of textbook-style coursework. One way to do so would be to offer a seamless, seven-year curriculum that combines bachelor's and doctoral education, thereby making the career path more attractive and reducing costs to investigators, institutions, and funding bodies. NSF may wish to fund exploration and development of this kind of program or curriculum.

ASPB urges support for NSF to further develop programs aimed at increasing the diversity of the scientific workforce by leveraging professional scientific societies' commitment to provide a professional home for scientists throughout their education and careers and to help promote and sustain broad participation in the sciences. Discrete focused training and infrastructure support programs for Hispanic Serving Institutions, Historically Black Colleges and Universities, and Tribal Colleges and Universities remain vitally important, because they foster a scientific workforce that reflects the U.S. population.

ASPB urges support for education research that enhances our understanding of how educational innovations can be sustainably and most effectively implemented in a variety of settings. Additionally, investigating and supporting effective approaches toward rolling out across the K-16 continuum the new vision for undergraduate biology education articulated in the 2010 Vision and Change report are particularly valuable. ASPB encourages continued support for education research programs within NSF's Education and Human Resources portfolio with a focus on understanding how previous investments in educational strategies can be made most effective.

Grand research challenges will not be resolved in a year, an administration, or a generation, but will take continued attention and investment at Federal research agencies, such as the National Science Foundation, over decades.

Thank you for your consideration of our testimony on behalf of the American Society of Plant Biologists. Please do not hesitate to contact us if we can be of any assistance in the future.

PREPARED STATEMENT OF THE ANIMAL WELFARE INSTITUTE

We wish to thank the Subcommittee for accepting our testimony as you consider fiscal year 2014 funding priorities under the Commerce, Justice, Science and Re-

lated Agencies Appropriations Bill. Our testimony addresses activities under the Office of Justice Programs (OJP) of the Department of Justice (DoJ).

We are grateful for the DoJ's OJP Bureau of Justice Assistance's continuing support for the Association of Prosecuting Attorneys' program of training, technical support, and other assistance for prosecutors, law enforcement, and others to enhance the prosecution of animal abuse and animal fighting crimes. We are proud to partner with APA in this ongoing effort (AWI does not receive any Federal funding for its work with APA), and I am pleased to be able to share with you the work that has been done as a result of BJA's support.

APA has held three national training conferences—in Los Angeles, Denver, and Washington D.C.—with support from BJA as well as from other partners. These national meetings bring together participants and speakers from many disciplines—law enforcement, psychology, animal control, veterinary medicine, the domestic violence and juvenile justice communities, etc.—to share their experiences dealing with animal cruelty and animal fighting, and to encourage cross-pollination among participants. Topics have included the basics of conducting an animal cruelty investigation; charging, prosecuting, and sentencing in animal cruelty cases; the use of forensics experts in court; the benefits of joint Federal-State investigations; and cutting edge considerations in the use of digital evidence. Participants then put theory into practice through a mock trial.

As an example of the impact that such training can have, an assistant prosecutor from a large urban county attended the very first conference. He and a colleague were taking on animal cruelty cases on their own, in addition to their regular caseload, and were feeling very much out in the wilderness. Today, their animal protection unit boasts four prosecutors who review and handle all animal-related cases (as well as other cases) and over the past 3 years has achieved a 98 percent conviction rate. One of the unit's cases resulted in significant jail time for two men who set fire to a dog in front of several witnesses, including children.

Two participants in the Los Angeles conference last year submitted testimonials that were published in the Fall/Winter 2012/2013 issue of Lex Canis, the newsletter of the APA's Animal Cruelty and Fighting Program; they are reproduced in part as follows:

“As a participant in the 3rd National Animal Cruelty Prosecution Conference, I experienced a comprehensive overview of the aspects of prosecuting animal abuse cases—from collecting evidence, identifying important elements of search warrants, and evaluating a case for filing, to communicating with expert witnesses such as veterinarians, preparing for trial, and sentencing recommendations

“One important concept that resonated with me is the need for cooperation among a wide variety of community stakeholders: prosecutors, law enforcement agencies, animal control officers, shelters, veterinarians, and of course, community members at large. For example, the first witness to animal abuse may be a lay person, such as a postal or utility worker, who has noticed odors or debris. Furthermore, because animal control officers may not be on duty 24/7, a law enforcement officer may be the first responder to a report of animal abuse. This underlines the need for community education as well as for the training of law enforcement officers in the legal and evidentiary issues unique to animal cruelty crimes

“Finally, a hands-on moot court was the focus of the last day Each conference participant received a flash drive to take home containing a wealth of resources, including handouts from the presentations as well as sample jury instructions, voir dire questions specific to animal abuse cases, veterinarian report templates, and more. I have had the opportunity to share some of these with the local animal control department, and the jury instructions have been particularly helpful while reviewing reports for filing consideration.

“I found the conference to be incredibly informative, and particularly as a new DDA, I feel substantially more prepared to tackle animal abuse cases in my community.”

—By Michelle Bergey, a new deputy district attorney with the San Bernardino County Office of the District Attorney.

“Arriving at the 3rd National Animal Cruelty Prosecution Conference and trying to choose which session to attend kept me up through the early morning hours of day one. . . . The first session, by the Los Angeles County District Attorney's Office, was awe-inspiring. I cannot think of a better way to kick off an animal cruelty prosecution conference than by learning about one of the most innovative prosecution programs in the country. From the investigation to the prosecution and sentencing of animal cruelty cases, it was incredibly helpful to get an outline of handling a case properly from the very beginning and to follow through as a zealous advocate of the victim through the sentencing phase.

"One of the most notable and useful conference sessions applicable to the work I do was "Using Veterinary Forensics to Prove Your Case," by Dr. Melinda Merck of Veterinary Forensics Consulting, LLC, and Sherry Ramsey of the Humane Society of the United States. Understanding the nuances of animal cruelty cases is crucial to a successful prosecution. Both speakers addressed the unique issues with noteworthy examples from past cases, even delving into instances of cruelty not traditionally prosecuted. I am constantly reviewing my notes and the materials from this session as I work through a current case; and learning to ask the veterinarian the right questions, as we did at the conference, has proven to be invaluable.

"Applying what I learned at the conference to a real case only reinforced the importance of the collaborative work we all do in the area of animal cruelty prosecution and affirmed the need for outreach programs like the new Animal Cruelty Prosecution Clinic at the University of Kansas. At least once a week, I refer back to my conference notes and the educational material we received. . . . I left Los Angeles only wishing I had more time. Thank you to the Association of Prosecuting Attorneys and the Bureau of Justice Assistance for putting on a stellar conference. I am anxiously awaiting the conference in 2013."

—By Katie Bray Barnett, an attorney at the Barnett Law Office, LLC, in Lawrence, Kansas. She assists humane societies on a variety of issues and works with area municipalities on animal-related legislation. Katie is the founder of the Student Animal Legal Defense Fund and the Animal Cruelty Prosecution Clinic at the University of Kansas School of Law.

Training and outreach do not stop with these large meetings, however. APA maintains a listserv, hosts Webinars addressing issues of practical concern to prosecutors and the many others whose work is connected with animal cruelty crimes, and responds to requests for technical assistance. The Animal Cruelty and Fighting Program section of its Web site makes available such valuable resources as training and informational manuals; State animal cruelty statutes; animal cruelty case law summaries; a library of briefs, motions, search warrants, and legal memos; and downloadable versions of the Webinars.

APA also publishes, distributes, and posts on its Web site the newsletter Lex Canis, each issue of which (there have been 13 so far) provides readers with program updates, an in-depth feature, and summaries of investigations, cases, changes in the law, and other developments. For example, recent features have focused on strategies for achieving success in prosecuting cases under State animal cruelty laws; dealing with hoarders; the innovative work of the Mayor's Anti-Animal Abuse Advisory Commission in Baltimore; and, in its very first issue in 2009, the effect of the foreclosure crisis on rising abuse and abandonment of companion animals.

APA and AWI have taken advantage of opportunities to address new audiences about the relationship between animal cruelty and interpersonal violence, and how those audiences can respond both to improve prosecutions of such cases and to reduce their incidence. Several presentations were made to the National Conference of Juvenile and Family Court Judges and to the Pennsylvania Bar Institute.

Last but not certainly not least, APA has assembled an Animal Cruelty Advisory Council composed of prosecutors, investigators, law enforcement, veterinarians, psychologists, members of the animal protection and domestic violence communities, and others, to identify issues, resource needs, and strategies. It brings these same professionals together to provide its multidisciplinary training, and also calls on them individually for topic-specific Web-based training and materials.

We respectfully urge the Subcommittee to continue funding the BJA's National Animal Cruelty and Fighting Initiative and to encourage the Department's ongoing interest in addressing animal-related crimes. Such crimes create a culture of violence—and a cadre of violent offenders—and more vigorous attention to such crimes makes communities safer overall.

The connection between animal abuse and other forms of violence has been firmly established through experience and through scientific studies. Among the most well-documented relationships is that between animal cruelty and domestic violence, child abuse, and elder abuse. For example, up to 71 percent of victims entering domestic violence shelters have reported that their abusers threatened, injured, or killed the family pet; batterers do this to control, intimidate, and retaliate against their victims. Batterers threaten, harm, or kill their children's pets in order to coerce them into allowing sexual abuse or to force them into silence about abuse.¹ Criminals and troubled youth have high rates of animal cruelty during their child-

¹ The study "I'll only help you if you have two legs, or why human service professionals should pay attention to cases involving cruelty to animals," by Loar (1999) as cited on the Web site of the National Coalition Against Domestic Violence (www.ncadv.org).

hoods, perpetrators were often victims of child abuse themselves,² and animal abusers often move on to other crimes. In 1997, the Massachusetts Society for the Prevention of Cruelty to Animals (MSPCA) released the results of a review of animal cruelty cases it had prosecuted between 1975 and 1996. Seventy percent of the individuals involved in those cases had been involved in other crimes, and animal abusers were five times more likely to commit a violent offense against other people.

More recently, an FBI special agent (who is also a member of the APA's Animal Cruelty Advisory Council) is currently overseeing a research project that involves "analyzing the criminal histories of offenders who were arrested for active animal cruelty, in order to further examine the potential link between animal cruelty and violence against persons." According to an initial analysis published in a dissertation (Leavitt, 2011), the majority of the 66 offenders examined so far "had prior arrests for other crimes," including interpersonal violence (59 percent), assault (39 percent), and assault of a spouse or intimate partner (38 percent); 17 percent had a history of sexual offenses.

Another connection that is all too common exists among animal fighting, gangs, and drugs, illegal guns, and other offenses. The Animal Legal and Historical Center at the Michigan State University College of Law describes dogfighting in these stark terms: "The notion that dogfighting is simply an animal welfare issue is clearly erroneous. Until the past decade, few law enforcement officials or government agencies understood the scope or gravity of dogfighting. As these departments have become more educated about the epidemic of dogfighting and its nexus with gang activity, drug distribution rings, and gambling networks, many have implemented well designed, sophisticated task forces. The magnitude of criminal activity concurrently taking place at the average dogfight is of such a scope as to warrant the involvement of a wide range of agencies, including local, regional, and Federal law enforcement agencies and their specialized divisions such as organized crime units, SWAT teams, and vice squads, as well as animal control agencies and child protective services."

Further evidence of the accuracy of the above assessment comes from a U.S. Drug Enforcement Administration report on the sentencing of a Louisiana drug trafficking kingpin, which described him as "an avid pit bull and cock fighter [who] utilized these illegal events as a networking tool in order to recruit members to transport and sell marijuana and cocaine for his organization."

Animal fighting is barbaric and is a violent crime in the truest sense of the term. It causes immense suffering to countless numbers of innocent animals and its presence threatens the safety of the entire community. It is illegal under both State and Federal law, so it well serves the entire community for law enforcement to have the most powerful tools possible to eradicate it. Animal fighting is fueled not just by those who train and fight the animals and finance the fights, but also by spectators. Spectators are not innocent bystanders; they are active participants in and enablers of these criminal enterprises—and they also provide "cover" during raids by allowing the organizers, trainers, etc., to "blend into the crowd" to escape arrest. The Animal Fighting Spectator Prohibition Act (H.R. 366 and S. 666) makes knowingly attending an animal fight punishable by fines and jail time and also makes it a separate offense, with higher penalties, to knowingly bring a minor to such an event, thus closing a significant loophole in Federal law. Forty-nine States have already outlawed attendance at an animal fight.

At the same time, it must be remembered that animal abuse is more than a "gateway" behavior. It is also a crime in its own right. It is a crime everywhere in the U.S., and certain egregious acts are felonies in 48 States (it was 47 this time last year!) and the District of Columbia. Some States have even enacted or are considering provisions that enhance the penalty for animal cruelty when it is committed in front of a child. Twenty-two States also now allow the inclusion of companion animals in domestic violence restraining orders.

All laws are not created equal, however; activity that constitutes a felony in one State may still only be a misdemeanor in another. In some States, cruelty rises to a felony only upon a second or third offense, or only if the animal dies; if he survives, no matter how severe his injuries, it is still a misdemeanor.

The key to offering animals the most protection possible, however weak or strong the statute, lies in ensuring awareness of the law, vigorous enforcement, and prosecution of violators. While many in law enforcement and the courts recognize animal abuse for the violent crime that it is and act accordingly, there are those who do not take it seriously, treating it as no more urgent than a parking infraction. Others genuinely want to act decisively but may lack the necessary resources, support, or

²"Woman's Best Friend: Pet Abuse and the Role of Companion Animals in the Lives of Battered Women," by Flynn (2000), as cited at www.ncadv.org.

expertise. Moreover, enforcement can be complicated by the laws themselves—weak laws are bad enough, but additional problems may arise from confusion over jurisdiction or limitations in coverage—or by pressure to dispose of cases quickly.

OJP/BJA showed great vision in recognizing that by identifying precursor crimes, such as animal cruelty and animal fighting, and ensuring proper adjudication of such cases, our criminal justice system can reduce the incidence of family and community violence and change the path of potential violent offenders. It is especially with respect to the latter goal that APA and AWI are also calling attention to the impact that experiencing animal cruelty has on children and their possible future involvement in the juvenile justice system; many youths in juvenile detention facilities have been exposed to community and family violence—which arguably includes animal fighting and abuse.

The National Animal Cruelty and Animal Fighting Initiative sends a very strong message to prosecutors and law enforcement that crimes involving animals are to be taken seriously and pursued vigorously, and that offenders must be held accountable.

PREPARED STATEMENT OF THE ASSOCIATION OF ZOOS AND AQUARIUMS

Thank you, Chairwoman Mikulski and Ranking Member Shelby for allowing me to testify on behalf of the nation's 211 U.S. accredited zoos and aquariums. Specifically, I want to express my support for the inclusion of \$3.981 million for the John H. Prescott Marine Mammal Rescue Assistance Grant Program and \$2,500,000 for the NOAA Ocean Education Grants Program in the fiscal year 2014 Commerce, Justice, Science, and Related Agencies appropriations bill.

Founded in 1924, the Association of Zoos and Aquariums (AZA) is a nonprofit 501c(3) organization dedicated to the advancement of zoos and aquariums in the areas of conservation, education, science, and recreation. AZA-accredited zoos and aquariums annually see more than 182 million visitors, collectively generate more than \$16 billion in annual economic activity, and support more than 142,000 jobs across the country. Over the last 5 years, AZA-accredited institutions supported more than 4,000 field conservation and research projects with \$160,000,000 annually in more than 100 countries. In the last 10 years, accredited zoos and aquariums formally trained more than 400,000 teachers, supporting science curricula with effective teaching materials and hands-on opportunities. School field trips annually connect more than 12,000,000 students with the natural world.

During the past twenty years AZA-accredited zoos and aquariums have rescued and rehabilitated more than 1,800 marine animals including stranded dolphins, whales, sea lions, seals, sea otters, sea turtles, and manatees. More than 1,750 (97 percent) of these animals have been successfully released back into their natural habitat. While the nations' accredited zoos and aquariums support wildlife rehabilitation through their ongoing animal rescue programs, these institutions are sometimes involved in addressing natural and manmade disasters such as the 2010 Deepwater Horizon Gulf oil spill. For example, following the oil spill, accredited zoos and aquariums around the country offered assistance by pledging the services of 200 animal care professionals and donating supplies, vehicles, and other resources to assist in the wildlife rescue efforts.

The John H. Prescott Marine Mammal Rescue Assistance Grant Program provides grants or cooperative agreements to eligible stranding network participants for the recovery and treatment (i.e., rehabilitation) of stranded marine mammals; data collection from living or dead stranded marine mammals; and, facility upgrades, operation costs, and staffing needs directly related to the recovery and treatment of stranded marine mammals and collection of data from living or dead stranded marine mammals. Eligible applicants are currently active, authorized participants, including AZA-accredited zoos and aquariums, or researchers in the National Marine Mammal Stranding Network.

Without the Prescott grant program, NOAA would have to rely on private organizations as it coordinates the response to marine mammals in distress; determines disease, injury and potential cause(s) of death; and supports emergency response for marine mammals during oil spills, outbreaks of diseases, and unusual mortality events. Network partners may not have the funds or the ability to respond to some stranding events, leaving animals at risk for prolonged exposure and likely death. Without funding for this program the critical ability to monitor marine mammal health trends, collect scientific data, and perform analysis would also be diminished. Information about the causes of marine mammal strandings is useful to the public because marine mammals can serve as an indicator of ocean health, giving insight

into larger environmental issues that also have implications for human health and welfare.

At the same time that AZA-accredited zoos and aquariums are working with Federal partners to conserve ocean wildlife, they also are providing essential learning opportunities, particularly about science, for schoolchildren in formal and informal settings. Increasing access to formal and informal science education opportunities has never been more important. Studies have shown that American schoolchildren are lagging behind their international peers in certain subjects including science and math.

The NOAA Ocean Education Grants Program brings students closer to science by providing them with the opportunity to learn firsthand about our world's marine resources. Through this grant program, aquariums work closely with Federal, State, and local partners on projects with long-lasting benefits not only for the students but their communities as well. For example, previous projects funded by NOAA Ocean Education Grants at AZA aquariums have focused on establishing a regional network of summer camp programs grounded in ocean science, enhancing teen conservation leadership programs, and conserving and managing coastal and marine resources to meet our nation's economic, social and environmental needs. As schools face increased budgetary pressures, these types of education programs at aquariums will become even more important in ensuring that American schoolchildren receive the necessary foundation in science education that they will need to be competitive in the 21st century global economy.

AZA-accredited zoos and aquariums are essential partners at the Federal, State, and local levels to improve education for schoolchildren and ensure that current and future generations will be good stewards of the world's oceans. Therefore, I urge you to include \$3.981 million for the John H. Prescott Marine Mammal Rescue Assistance Grant Program and \$2,500,000 for the NOAA Ocean Education Grants Program in the fiscal year 2014 Commerce, Justice, Science, and Related Agencies appropriations bill.

Thank you.

PREPARED STATEMENT OF THE FEDERATION OF AMERICAN SOCIETIES FOR
EXPERIMENTAL BIOLOGY

The Federation of American Societies for Experimental Biology (FASEB) respectfully requests an appropriation of at least \$7.4 billion for the National Science Foundation (NSF) in fiscal year 2014. This figure enables NSF to continue to support paradigm-shifting basic research and essential science, technology, engineering, and math education programs that drive the United States innovation economy.

NSF is the only Federal research agency dedicated to advancing fundamental research and education across all fields of science and engineering. NSF serves as the primary Federal funding source for research in fields such as mathematics, computer science, basic biology with direct application to human health, and the social sciences. In addition to fostering scientific research, the agency undertakes innovative efforts to strengthen science, technology, engineering, and mathematics education nationwide. These grants, awarded to projects of the highest quality and greatest significance in all 50 States, are selected using a rigorous merit-review process that evaluates proposals on both scientific and societal value.

Recent examples of outstanding NSF funded research include using light to better understand the brain. The overwhelming complexity of the brain limits our ability to understand and treat neurological and psychiatric illnesses. The emerging technique of optogenetics represents a promising approach to overcoming this limitation by deconstructing the brain's complexity. Using light-responsive proteins, genetically introduced into the cells of living organisms, optogenetics allows the behavior of highly specific and functionally similar populations of cells to be controlled. Researchers are using optogenetics to make phenomenal progress in the expansion of our knowledge of the brain, which lays the foundation for the next generation of new breakthrough therapies for Parkinson's disease and other devastating disorders.

NSF is also supporting the exciting work aimed at building biological machines. Using only hydrogel, heart cells, and a 3-D printer, researchers have created cell-powered, non-electric walking machines. The locomotion of the "bio-bot" is driven by the beating of heart cells. By integrating different types of cells that are sensitive to specific environmental stimuli, such as a drugs or toxins, bio-bots could be used as sensors. Eventually, bio-bots may be used as neutralizers of toxic chemicals and could be customized for applications in medicine, energy, defense, and the environment.

In addition, NSF supports studies aimed at using biodiversity to develop biofuel alternatives. The search for alternate energy sources is growing in economic importance as the fossil fuel supply rapidly depletes and concerns about its environmental effects grow. NSF-supported research at the Cedar Creek Ecosystem Science Reserve is exploring the use of prairie biomass as an alternative biofuel to corn and soybean monocultures. Prairie plots with higher species diversity yield a greater energy gain than monocultures, and sequester larger amounts of carbon dioxide in soil and in underground root systems. The discoveries at Cedar Creek suggest that high-diversity prairie biomass may be a viable biofuel alternative for our nation's energy needs that minimizes production of greenhouse gases, while simultaneously providing wildlife benefits and ecosystem values.

Another example of the groundbreaking science being funded by NSF is in the area of hearing loss research. Recently, a team of scientists has determined the 3-D atomic structure of an important component of inner ear hair cells essential for both hearing and balance. Inner ear hair cells have bundles of cilia on their exposed surface that convert sound and head position information into neural signals. The maintenance of physical linkages among cilia in the bundles is critical to proper functioning of the inner ear. Genetic mutations in the proteins responsible for this linkage often result in congenital deafness and balance disorders. Armed with the atomic structure and biological mechanism, results of this research will position researchers to develop more powerful therapeutic interventions for hearing impairment and balance deficits.

Finally, NSF plays the crucial role of nurturing the next generation of scientists. An NSF program to prepare future scientists and engineers, the Graduate Research Fellowship Program (GRFP) annually awards approximately 2,000 three-year fellowships to outstanding graduate students pursuing advanced degrees in science, technology, engineering, or mathematics. NSF graduate research fellows have become leaders in the scientific community, including Brian K. Kobilka, the 2012 Nobel Prize winner in Chemistry and Serge Haroche and David J. Wineland, who received the 2012 Nobel Prize in Physics.

At a time when the United States faces unprecedented fiscal challenges, scientific and technological advances are needed to keep our nation globally competitive and enable the economic growth that is born out of discovery and innovation. NSF's broad portfolio of fundamental research expands the frontiers of knowledge, and fuels future innovation. Furthermore, through its education and training initiatives, NSF ensures the development of a world-class scientific and engineering workforce, including at research institutions and high-tech companies.

NSF-funded research is a critical source of scientific breakthroughs, many of which provide the basic knowledge that fuels innovation in other, more mission-oriented agencies. Failure to build on prior NSF investments and continue support for the agency as science expands, would slow the pace of discovery, discourage the next generation of scientists and engineers, and sacrifice our position as the global leader in innovation. Therefore, FASEB recommends a minimum funding level of \$7.4 billion for the National Science Foundation in fiscal year 2014 to prevent contraction. Our broader goal is a sustainable research program, a return to the demonstrated capacity level, and a funding trajectory reflective of the America COMPETES Act reauthorization. Our recommended increase of \$304 million would fund an additional 324 projects.

PREPARED STATEMENT OF JILLIAN WORSSAM

Quantifiably: over 300 students in Arizona working directly with scientists either working for NOAA or associated scientific fields as learned about through the NOAA Teacher at Sea Program. Over 500 Arizona community members participating in community appearances—presented by me—with topics ranging from physical oceanography, ecosystem awareness of the Bering Sea, climate change, and Polar Ecology. Over 1,000 fifth grade students introduced to ocean science in polar ecosystems. Student work Web page—<http://scientistsinthe classroom.pbworks.com>—documenting student work in collaboration with scientists as developed partnerships through the NOAA Teacher at Sea Program.

Topics discussed after Teacher at Sea, related to NOAA mission:

- Hurricane hunting pilots
- Tsunami experts
- Marine Biologist
- Fisheries biologists
- Ocean Sciences
- Polar Ecology

- Paleo Climatology
- Oceanic Biologist
- Submarine Ground Water Discharge
- Climate Change

Sampling of Organizations partnering after the Teacher at Sea Program (please note I teach in Arizona):

- MBARI
- University of Alaska Fairbanks
- University of Washington
- Polarfield Services
- PolarTREC
- U.S. Coast Guard
- North Pacific Research Board
- NOAA

Thanks to my participation in the NOAA Teacher at Sea Program I have been able to develop a one on one mentor program in my science classes, which is now expanding school wide, and to the Flagstaff Community. I was able to develop and enhance this program because of NOAA and the Teacher at Sea Program. My curriculum is directly connected to the next generations science standards, collated with ELA standards, discusses and uses current scientific data from the field, and discusses climate change. A lifetime career has been impacted positively all after spending 30 days aboard the NOAA ship Miller Freeman (which coincidentally was just decommissioned a little over a week ago).

To think that NOAA is even considering the removal of such a vital program is a crime! Arizona, a land locked State where children have a limited comprehension of our oceanic planet now know about the importance of this massive ecosystem because I participated in the Teacher at SEA Program. Much of America is not coastal, how do you expect American citizens to understand the vital nature of the oceans, and their scientific significance if not through the Teacher at Sea Program?

America's Next Generation Science Standards directly reference climate change and the importance of teaching this vital science. As the Earth's entire climate is directly related to the processes and functions of the ocean and atmosphere interface, I am befuddled to think that one would even consider cutting such a vital program as the NOAA Teacher at Sea experience. Glaciers are melting, the chemistry of the ocean changing, temperatures fluctuating, atmospheric gases at alarming levels. NOAA, America's leading scientific organization for collecting and disseminating scientific data is the only national agency dedicated to supporting and encouraging the collaboration between teachers and scientists in their Teacher at Sea Program.

Please hear my plea, I am a dedicated public educator, supported by NOAA and their mission: To understand and predict changes in climate, weather, oceans and coasts. To share that knowledge and information with others. To conserve and manage coastal and marine ecosystems and resources.

I am the past NOAA Teacher at Sea who quit her teaching job for a year to work on the NOAA ship Miller Freeman, to build my skills to better serve my constituents, tomorrow's leaders. Why can't today's leaders listen and support the future of America! Please do not cut the NOAA Teacher at Sea Program!

PREPARED STATEMENT OF THE GEOLOGICAL SOCIETY OF AMERICA

SUMMARY

The Geological Society of America (GSA) supports strong and sustained investments in earth science research and education at the National Science Foundation (NSF) and National Aeronautics and Space Administration (NASA). These investments are necessary to address such issues as energy resources, water resources, climate change, waste management, and natural hazards and train the next generation of earth science professionals. GSA urges Congress to provide the National Science Foundation (NSF) at least \$7.033 billion in fiscal year 2014, which is the same amount appropriated in fiscal year 2012, and support as many of the increases in the Administration's budget request as possible. Although this funding level would fall well short of the vision to double the NSF budget in the America COMPETES Reauthorization Act of 2010, it would allow NSF to return to pre-sequestration levels. GSA also supports sustained funding for earth science research at NASA. We believe investment in NSF is necessary for America's future economic and science and technology leadership, both through discoveries that are made through this investment and through the talent developed through NSF programs. GSA would like to thank the Senate Appropriations Subcommittee on Commerce,

Science, Justice, and Related Activities for its leadership in increasing investments in the National Science Foundation in fiscal year 2013 and its recognition of the critical role research plays in our nation's future.

The Geological Society of America, founded in 1888, is a scientific society with over 25,000 members from academia, government, and industry in all 50 States and more than 90 countries. Through its meetings, publications, and programs, GSA enhances the professional growth of its members and promotes the geosciences in the service of humankind.

NATIONAL SCIENCE FOUNDATION

The Geological Society of America (GSA) greatly appreciates your efforts to increase the National Science Foundation (NSF) budget in fiscal year 2013. Although your efforts prevented the most severe cuts, GSA remains concerned about the impact of sequestration cuts on NSF and our nation's future innovations and innovators. The cuts from the sequester are estimated to cause NSF to fund fewer proposals this fiscal year, affecting thousands of scientists, educators, technicians, and students. NASA, too, has announced it will decrease the number of scientific proposals it will be able to fund. We are greatly concerned about areas of investigation that will not be explored as well as the impact on the next generation of scientists. As proposal rates decrease, young scientists will likely be most affected, leading them to consider careers outside of the science and causing the loss of our next general of scientists and educators.

As Congress recognized in the America COMPETES Act and its 2010 reauthorization, science and technology are engines of economic prosperity, environmental quality, and national security. In 2010, the National Academies issued a report, *Above the Gathering Storm, Revisited*, that speaks to the need to invest in research, even in a tight fiscal environment: "It would be impossible not to recognize the great difficulty of carrying out the Gathering Storm recommendations, such as doubling the research budget, in today's fiscal environment . . . with worthy demand after worthy demand confronting budgetary realities. However, it is emphasized that actions such as doubling the research budget are investments that will need to be made if the nation is to maintain the economic strength to provide for its citizens healthcare, social security, national security, and more."

Likewise, the National Commission on Fiscal Responsibility and Reform, headed by Erskine Bowles and Alan Simpson, said: "[W]e must invest in education, infrastructure, and high-value research and development to help our economy grow, keep us globally competitive, and make it easier for businesses to create jobs."

GSA urges Congress to provide the National Science Foundation (NSF) at least \$7.033 billion in fiscal year 2014, which is the same amount appropriated in fiscal year 2012, and support as many of the increases in the Administration's budget request as possible. Although this funding level would fall well short of the vision to double the NSF budget as stated in the America COMPETES Act, it would allow NSF to return to pre-sequestration levels. We believe investment in NSF is necessary for America's future economic and science and technology leadership, both through discoveries that are made through this investment and through the talent developed through NSF programs.

The earth sciences are critical components of the overall science and technology enterprise and NSF investment. Earth science research provides knowledge and data essential for developing policies, legislation, and regulations regarding land, mineral, energy, and water resources at all levels of government. NSF's Earth Sciences Division regularly receives a large number of exciting research proposals that are highly rated for both their scientific merit and their broader impacts, but many meritorious projects have not been funded due to budget constraints. Sequestration and budget cuts increase the number of proposals in this category.

It is critically important to increase NSF's investments in earth science research and education to meet challenges posed by human interactions with Earth's natural system and to help sustain these natural systems and the economy. Increased investments in NSF's earth science portfolio are necessary to address such issues as natural hazards, energy, water resources, climate change, and education. Specific needs include:

- Natural hazards remain a major cause of fatalities and economic losses worldwide. Several areas in the United States are vulnerable to damages from earthquakes, tsunamis, volcanoes, and landslides—as evidenced by the recent west coast landslide. NSF research that improves our understanding of these geologic hazards will allow for better planning and mitigation in these areas that will reduce future losses. We urge Congress to support NSF investments in funda-

mental earth science research that stimulate basic understanding and innovations in natural hazards monitoring and warning systems.

- Energy and mineral resources are the foundation of many technologies and economies. The Division of Earth Sciences supports proposals for research geared toward improving the understanding of the structure, composition, and evolution of the Earth and the processes that govern the formation and behavior of the Earth's materials. This research contributes to a better understanding of the natural distribution of mineral and energy resources for future exploration. In particular, GSA encourages support for research on rare earth materials, for which our nation is dependent upon foreign sources.
- The devastating droughts last year reminded us of our dependence on water. NSF's research addresses major gaps in our understanding of water availability, quality, and dynamics, and the impact of both a changing and variable climate, and human activity, on the water system.
- Forecasting the outcomes of human interactions with Earth's natural systems, including climate change, is limited by an incomplete understanding of geologic and environmental processes. Improved understanding of these processes in Earth's deep-time history can increase confidence in the ability to predict future states and enhance the prospects for mitigating or reversing adverse impacts to the planet and its inhabitants.

Research in Earth science is fundamental to training and educating the next generation of Earth science professionals. The United States faces a looming shortage of qualified workers in these areas that are critical for national security. We are very concerned that cuts in earth science funding will cause students and young professionals to leave the field, potentially leading to a lost generation of professionals in areas that are already facing worker shortages.

A 2013 report by the National Research Council, Emerging Workforce Trends in the Energy and Mining Industries: A Call to Action, found, "Energy and mineral resources are essential for the nation's fundamental functions, its economy, and its security . . . In mining (nonfuel and coal) a personnel crisis for professionals and workers is pending and it already exists for faculty."

Another recent study, Status of the Geoscience Workforce 2011, by the American Geosciences Institute found: "The supply of newly trained geoscientists falls short of geoscience workforce demand and replacement needs. . . . aggregate job projections are expected to increase by 35 percent between 2008 and 2018. . . . The majority of geoscientists in the workforce are within 15 years of retirement age. By 2030, the unmet demand for geoscientists in the petroleum industry will be approximately 13,000 workers for the conservative demand industry estimate."

Increased NSF investments in earth science education at all levels are needed because knowledge of the earth sciences is essential to science literacy and to meeting the environmental and resource challenges of the twenty-first century. NSF's Education and Human Resources Division researches and improves the way we teach science and provide research and fellowship opportunities for students to encourage them to continue in the sciences.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

GSA supports planetary exploration to advance research concerning the evolution of Earth; to deepen and expand human understanding of our place in the universe; to reinforce science, technology, engineering and math (STEM) education and effective training of the next generation of scientists; to increase U.S. competitiveness in science and technology development; and to enhance the quality of life through technological innovation.

Planetary missions at NASA are designed to collect data to better understand the history and workings of the entire solar system, to gain insight into the formation and evolution of Earth and the other planets, to understand how life began on Earth, and to determine whether extraterrestrial habitable environments and life forms exist (or ever did exist) elsewhere in the solar system or beyond. To support these missions, planetary scientists engage in both terrestrial field studies and Earth observation to examine geologic features and processes that are common on other planets, such as impact structures, volcanic constructs, tectonic structures, and glacial and fluvial deposits and landforms. Geochemical studies include investigations of extraterrestrial materials now on Earth, including lunar samples, tens of thousands of meteorites, cosmic dust particles, and, most recently, particles returned from comets and asteroids.

Exploration of other planets in the solar system requires major national and international initiatives, significant funding levels, and long timelines for mission planning and collaborative research. For scientists, the funding cycle is much shorter

than typical mission cycles, and in particular, graduate student and career-development timelines are much shorter than mission timeframes. Therefore, the growth and continued development of a robust workforce capable of conducting complex space missions and analyzing the scientific data returned from such missions does not depend on individual missions as much as it depends upon a consistent, sustained program that educates and develops planetary scientists.

GSA supports NASA earth observing systems and their research into our planet. By providing adequate resources to maintain current and develop next-generation satellites, the nation will continue to have access to data that is used for a range of activities, including climate and weather forecasting used by diverse stakeholders ranging from farmers to water managers.

Please contact GSA Director for Geoscience Policy Kasey White for additional information or to learn more about the Geological Society of America—including GSA Position Statements on water resources, planetary research, energy and mineral resources, natural hazards, climate change, and public investment in earth science research.

PREPARED STATEMENT OF THE INSTITUTE OF MAKERS OF EXPLOSIVES

INTEREST OF THE IME

IME is a nonprofit association founded a century ago to provide accurate information and comprehensive recommendations concerning the safety and security of commercial explosive materials. IME represents U.S. manufacturers, distributors and motor carriers of commercial explosive materials and oxidizers as well as other companies that provide related services. The majority of IME members are “small businesses” as determined by the U.S. Small Business Administration.

Millions of metric tons of high explosives, blasting agents, and oxidizers are consumed annually in the United States. These materials are essential to the U.S. economy. Energy production, construction, and other specialized applications begin with the use of commercial explosives. IME member companies produce ninety-nine percent of these commodities. These products are used in every State and are distributed worldwide. The ability to manufacture, distribute and use these products safely and securely is critical to this industry.

Commercial explosives are highly regulated by a myriad of Federal and State agencies. ATF plays a predominant role in assuring that explosives are identified, tracked, purchased, and stored only by authorized persons. In the absence of the administration’s fiscal year 2014 budget request, we are in uncharted territory in terms of our analysis of the President’s budgetary priorities.¹ Likewise, as Congress presses ahead to finalize appropriations for fiscal year 2013, we are not privy to specifics as to how ATF may prioritize the work of the agency’s programs overseeing the explosives industry. Nevertheless, we offer the following comments to give perspective about the need to ensure that the ATF has sufficient funds to carry out its mission to ensure that commercial explosives are not misappropriated for criminal or terrorist purposes.

ATF’S EXPLOSIVES REGULATORY PROGRAM

As of the date of this comment, it appears that Congress is prepared to provide a fiscal year 2013 appropriation of \$1.153 billion for ATF, subject to a sequestration order if the President fails to reach agreement with Congress on an alternative. This is the same amount as in the administration’s original budget request of fiscal year 2013. The administration’s fiscal year 2013 budget request proposed to decrease resources devoted to ATF’s regulation and oversight of explosives industries by 24 FTE, a 7 percent reduction, from 335 FTE to 311 FTE, for a savings of \$940,000.² This FTE reduction represents nearly half of the staffing reduction the Bureau’s Arson and Explosives Program is being asked to absorb. Given that it appears Congress is prepared to accept the President’s request, we assume that the staffing cuts will be enacted. As we look forward to fiscal year 2014, the budget situation does not improve. We understand that the cap on non-emergency appropriations for fiscal year 2014 to drop to \$966 billion, down from the cap of \$984 billion in fiscal year 2013.

¹The Budget Act requires the submission of the President’s budget request by the first Monday in February. The current expectation is that the President’s fiscal year 2014 request will be released in April.

²See, Fiscal Year 2013 ATF Budget Submission.

We understand the current urgency to address the Federal budget deficit. We understand the shared sacrifice that all segments of the Government are being asked to make to help the economy recover by spurring job growth and investment. We also understand the public attention to other programmatic responsibilities of ATF, and the attendant pressure to divert resources to the addressing these responsibilities. However, the success of the Bureau's explosives industry programs to prevent the misappropriation of commercial explosives should not be used against us. Budgetary cuts of personnel essential to perform services needed by our industry to engage in the commerce of explosives, hurts our industry, our customers, and the U.S. economy.

By law, ATF must inspect over 11,000 explosives licensees and permittees at least once every 3 years³ and conduct background checks of so-called "employee possessors" of explosives and "responsible persons." During fiscal year 2012, ATF conducted over 4,000 such compliance inspections and identified 1,392 public safety violations.⁴ In addition to this workload, ATF must process applications for new explosives licenses and permits as well as those submitted for renewal of existing licenses and permits. Over 2,700 such applications were processed during the last full fiscal year.⁵ The Bureau must also conduct inspections of all new applicants. Over 56,000 background checks were completed for employee possessors and over 9,000 for responsible persons.⁶ These are significant workload indicators.

ATF recognizes that its ability to perform its statutory responsibilities will be negatively impacted by these resource cuts. ATF estimates that, in fiscal year 2010, it met its statutory responsibilities 95.8 percent of the time. In fiscal year 2012, it estimates that this performance rate will fall to 88 percent. And, with the resource cuts anticipated in fiscal year 2013, this outcome metric will fall to 85 percent, before the potential effect of sequester. The Bureau's falling productivity cannot help but have adverse impacts on our industry. Without approved licenses and permits from ATF, our industry cannot conduct business. Delays in servicing the needs of our industry may lead to disruptions in other segments of the economy that are dependent on the products and materials we provide.

At the same time, duplication between Government programs wastes resources. The U.S. Government Accountability Office (GAO) has highlighted areas of duplication between the ATF and the Federal Bureau of Investigation (FBI) that relate to explosives incidents.⁷ As early as 2004, duplication and overlap were identified in the areas of investigations, training, information sharing and use of databases, and laboratory forensic analysis. While ATF's budget request provides updates of plans for consolidating and eliminating these redundancies, we continue to watch for other potential areas of overlap. In describing its role as the sole repository of data on explosives incidents, ATF states that "eight billion pounds of ammonium nitrate are produced, of which half is used for explosives."⁸ In fact, the percentage used by the explosives industry has been rising and currently stands at 70 percent. As a regulatory matter, the security of ammonium nitrate (AN), along with other explosives precursors, has been delegated to the U.S. Department of Homeland Security (DHS). We believe that DHS could learn from ATF's regulation of commercial explosives as it finalizes rules to secure the commerce of AN. In particular, DHS should recognize that employees who have been vetted and cleared by ATF to possess explosives should not have to be vetted again in order to engage in the commerce of AN.

As the Subcommittee considers ATF's budget request, we ask that the Bureau's ability to perform its regulatory oversight of the explosives industry in a timely fashion not be compromised in the push for fiscal discipline when other areas of duplication and overlap are ripe for reform.

ATF'S REGULATORY WORKLOAD

Since 2003 when ATF was transferred to the Department of Justice, the agency has issued eight rulemakings of importance to IME (including two interim final rules). It has finalized three, withdrawn two, and merged two. Of the two

³ ATF estimates that the requirement to inspect 100 percent of the licensees and permittees within their three-year license/permit cycle consumes between 25 percent and 41 percent of available inspector resources in any given year.

⁴ See, Fiscal Year 2013 ATF Budget Submission.

⁵ See, Fiscal Year 2013 ATF Budget Submission.

⁶ See, Fiscal Year 2013 ATF Budget Submission.

⁷ "Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue," GAO, March 2011, pages 101–104, <http://www.gao.gov/new.items/d11318sp.pdf>.

⁸ See, Fiscal Year 2013 ATF Budget Submission. 2012 data estimates put total AN production at 6.8 billion pounds.

rulemakings still pending, one is an interim final rule which dates to 2003. In the absence of a process to ensure timely rulemaking that is capable of keeping up with new developments and safety practices, industry must rely on interpretive guidance and variances from outdated requirements in order to conduct business. While we greatly appreciate the Bureau's accommodations, these stop-gap measures do not afford the continuity and protections that rulemaking would provide the regulated community, nor do they allow the oversight necessary to ensure that all parties are being held to the same standard of compliance. These regulatory tasks are critical to the lawful conduct of the commercial enterprises that the Bureau controls. ATF should be provided the resources to make timely progress in this area.

ATF-INDUSTRY PARTNERSHIP

The ATF Bomb Data Center (BDC) is the sole repository for explosives related incident data, and contains information on thousands of explosives incidents investigated by ATF and other Federal, State, and local law enforcement agencies. While this data helps government entities to perform trend analysis and to compare incidents for similarities and crime methodologies, BDC data would also help industry as it refreshes and updates best practice recommendations. Until 2006, this data used to be routinely provided to industry stakeholders. IME is currently engaged in discussion with ATF in the hope that the Bureau will once again provide the regulated community key data on bomb or improvised device fillers, as well as thefts, losses and recoveries by type and amount of explosives and point in the supply chain when the thefts and losses occurred. ATF needs the resources to continue this important service.

Explosives manufacturers and importers are required to mark our products with codes to aid law enforcement agencies in the U.S. and in foreign countries in the tracing of these materials when they are lost or stolen. Explosives manufacturers and importers and others in the global supply chain cooperate in tracing efforts. However, more and more government entities are imposing their own unique system of marks without reciprocally recognizing each other's marks. These redundant and competing marks are creating non-tariff barriers to trade. We are asking ATF to join with us in working to harmonize a global marking standard.

Since 2003, ATF, with our support, has required background checks of persons authorized to possess explosives. While this background check included vetting against the Terrorist-Screening Database (TSDB), being named on the database does not disqualify individuals from possessing explosives. We think this is an oversight. Recently, Senator Frank Lautenberg and Representative Peter King introduced legislation, S. 34 and H.R. 720, respectively, to close this glaring security gap in Federal explosives law. This legislative change will better harmonize the vetting and clearance procedures used by the ATF with other government agencies that perform security threat assessments of individuals seeking to engage in security-sensitive activities. As these standards are harmonized, opportunities to leverage other vetting programs and security credentials increases. This outcome would add intelligence value to all government vetting programs sharing the same platform, and provide savings to the Federal Government and the regulated community.

INDUSTRY STANDARDS

We take seriously the statutory obligation that ATF take into account industry's standards of safety when issuing rules and requirements.⁹ We continue to fulfill this obligation through our development of industry best practices for safety and security, membership in relevant standard-setting organizations, and active participation in forums for training. We have offered ATF recommendations that we believe will enhance safety and security through participation in the rulemaking process, in the Bureau's important research efforts, and in other standard-setting activities.

In this regard, IME has spent years developing a credible alternative to strict interpretation of quantity distance tables used to determine safe setback distances from explosives. IME collaborated in this development with the Department of Defense Explosives Safety Board as well as Canadian and U.S. regulatory agencies, including ATF. The result is a Windows-based computer model for assessing the risk from a variety of commercial explosives activities called IMESAFR.¹⁰ ATF and other

⁹ 18 U.S.C. 842(j).

¹⁰ IMESAFR was built on the DDESB's software model, SAFER. The DDESB currently uses SAFER and table-of-distance methods to approve or disapprove Department of Defense explosives activities. Not only can IMESAFR determine the amount of risk presented, but it can also determine what factors drive the overall risk and what actions would lower risk, if necessary. The probability of events for the activities were based on the last 20 years' experience in the

regulatory agencies are recognizing the value of IMESAFR and participated in development meetings for Version 2.0. ATF is also evaluating existing licensed locations with this risk-based approach and exploring use of the software for variance requests. These efforts are vital for ATF to remain on the forefront of public safety and we strongly encourage ATF's continued support. The benefits of risk-based modeling should be officially recognized by ATF and resources should be provided to develop policies that allow the use of such models to meet regulatory mandates.

LEADERSHIP

The resolution of these issues may have to wait the appointment of a new ATF director. The Bureau has been without a director since August 2006. We support President Obama's nomination of B. Todd Jones for this position. We hope that the Senate will timely act on this nomination. The Bureau has been too long without permanent leadership.

CONCLUSION

The manufacture and distribution of explosives is accomplished with a remarkable degree of safety and security. We recognize the critical role ATF plays in helping our industry achieve and maintain safe and secure workplaces. Industry and the public are dependent on ATF having adequate resources to fulfill its regulatory responsibilities. It is up to Congress and, in particular, this Subcommittee to ensure that ATF has the resources it needs. We strongly recommend full funding for ATF's explosives program.

PREPARED STATEMENT OF THE INNOCENCE PROJECT

On behalf of the Innocence Project, thank you for allowing me to submit testimony to the Senate Committee on Appropriations Subcommittee for Commerce, Justice, Science, and Related Agencies as it considers budget requests for fiscal year 2014. I write to request funding for the following programs, please:

- \$3 million for the Wrongful Conviction Review and the Capital Litigation Improvement Programs (the Wrongful Conviction Review Program is a part of the Capital Litigation Improvement Program), at the Department of Justice (DoJ), Bureau of Justice Assistance (BJA);
- \$4 million for the Kirk Bloodsworth Post-Conviction DNA Testing Program (the "Bloodsworth Program") at the DoJ, National Institute of Justice (NIJ);
- \$12 million for the Paul Coverdell Forensic Sciences Improvement Grant Program (the "Coverdell Program") at the NIJ; and
- \$9 million to strengthen the forensic sciences, including support for the National Commission on Forensic Science, research at the National Institute of Standards and Technology for forensic science measurement science and standards, and establishment of a forensic science grant program at the National Science Foundation.

Freeing innocent individuals and preventing wrongful convictions through reform greatly benefit public safety. Every time DNA identifies a wrongful conviction, it enables the identification of the real perpetrator of those crimes. True perpetrators have been identified in approximately half of the over 300 DNA exoneration cases. Unfortunately, many of these real perpetrators had gone on to commit additional crimes while an innocent person was convicted and incarcerated in their place.

To date, 305 individuals in the United States have been exonerated through DNA testing, including 18 who served time on death row. These innocents served on average more than 13 years in prison before exoneration and release. However, I want to underscore the value of Federal innocence programs not to just these exonerated individuals, but also to public safety, fairness, and achieving true justice for victims of violent crimes. It is important to fund these critical innocence programs because reforms and procedures that help to prevent wrongful convictions enhance the accuracy of criminal investigations, strengthen criminal prosecutions, and result in a stronger, fairer system of justice that provides true justice to victims of crime.

WRONGFUL CONVICTION REVIEW PROGRAM

Particularly when DNA is not available, or when DNA alone is not enough to prove innocence, proving one's innocence to a level sufficient for exoneration is difficult compared to "simply" proving the same with DNA evidence. These innocents

U.S. and Canada and can be adjusted to account for different explosive sensitivities, additional security threats, and other factors that increase or decrease the base value.

languishing behind bars require expert representation to help navigate the complex issues that invariably arise in their bids for post-conviction relief. And the need for such representation is enormous when only a small fraction of cases involve evidence that could be subjected to DNA testing. Realizing the imperative presented by such cases, the BJA dedicated part of its Capital Litigation Improvement Program funding to create the Wrongful Conviction Review program.¹ The program provides applicants—non-profit organizations and public defender offices dedicated to exonerating the innocent—with funds for providing high quality and efficient representation for potentially wrongfully convicted defendants in post-conviction claims of innocence. This program forms a considerable piece of the Federal package of innocence protection measures created in recent years; without it, a great deal of innocence claims might otherwise fall through the cracks.

Numerous Innocence Network organizations have been able to enhance their case-loads and representation of innocents as a result of the Wrongful Conviction Review grant program, including those in Alaska, Minnesota, Pennsylvania, and at the University of Baltimore. During the past 2 years, the Florida Innocence Project was able to achieve the exoneration of Derrick Williams through the support of this program, and the Mid-Atlantic Innocence Project helped secure the exoneration of Thomas Haynesworth in Virginia. Grant funds enabled the Northern California Innocence Project to hire staff to screen cases, thereby permitting their existing attorneys to commit to litigation, which resulted in the exonerations of three innocent Californians, Obie Anthony, Maurice Caldwell, and Franky Carillo. With Wrongful Conviction Review funding, the Innocence Project of Minnesota was able to prove that Michael Hansen did not kill his 3 month old. Additionally, Darrin Hill was exonerated after being wrongly confined at a State mental health facility for 20 years. Staff, who were cataloging evidence at Orleans Parish Criminal District Court pursuant to the grant secured for the State by the Innocence Project New Orleans (IPNO), found the rape kit that was collected in the case. IPNO's research suggests this is the first case ever in which a person so committed has been freed due to proof of innocence. The DNA testing not only freed Darrin, it has also provided law enforcement with the actual rapist's DNA profile.

To help continue this work, we urge you to provide a total of \$3 million for the Wrongful Conviction Review and the Capital Litigation Improvement Programs. (The Wrongful Conviction Review Program is a part of the Capital Litigation Improvement Program.)

THE BLOODSWORTH PROGRAM

The Bloodsworth Program provides hope to innocent inmates who might otherwise have none by helping States more actively pursue post-conviction DNA testing in appropriate situations. These funds have had a positive impact that has led to great success. Many organizational members of the Innocence Network have partnered with State agencies that have received Bloodsworth funding.²

The Bloodsworth Program does not fund the work of organizations in the Innocence Network directly, but instead funds State applicants which seek support for a range of entities involved in settling innocence claims, including law enforcement agencies, crime laboratories, and a host of others, and often in collaboration. Through this process, the Bloodsworth Program has fostered the cooperation of organizations in the Innocence Network and State agencies. For example, the Arizona Justice Project, in conjunction with the Arizona Attorney General's Office, began the Post-Conviction DNA Testing Project. Together, they have canvassed the Arizona inmate population, reviewed cases, worked to locate evidence and filed joint requests with the court to have evidence released for DNA testing. In addition to identifying the innocent, Arizona Attorney General Terry Goddard has noted that the "grant enables [his] office to support local prosecutors and ensure that those who have committed violent crimes are identified and behind bars."³ Such joint efforts have also been pursued in Connecticut, Louisiana, Minnesota, North Carolina, and Wisconsin. According to NIJ, Bloodsworth Program funding has contributed to at least 15 exonerations. Most recently, Robert Dewey was released from prison after serving nearly 18 years for a rape and murder he did not commit. Colorado's Justice Review Project was able to achieve his exoneration through DNA testing funded by the pro-

¹ Reauthorization of the Innocence Protection Act. 111th Cong., 1st Sess., 8 (2009) (testimony of Lynn Overmann, Senior Advisor, Office of Justice Programs).

² The Innocence Network is an affiliation of organizations dedicated to providing pro bono legal and investigative services to individuals seeking to prove innocence of crimes for which they have been convicted and working to redress the causes of wrongful convictions.

³ Arizona receives Federal DNA grant, <http://community.law.asu.edu/news/19167/Arizona-receives-federal-DNA-grant.htm> (last visited Mar. 13, 2012).

gram. Additionally, the true perpetrator has been identified through several Bloodsworth Program exonerations. For example, Virginian Thomas Haynesworth was freed thanks to Bloodsworth-funded testing that also revealed the real perpetrator. We ask that you please provide \$4 million to continue the work of the Bloodsworth Post-Conviction DNA Testing Program.

THE COVERDELL PROGRAM

Recognizing the need for independent government investigations in the wake of forensic scandals, Congress created the forensic oversight provisions of the Coverdell Program, a crucial step toward ensuring the integrity of forensic evidence. Specifically, in the Justice for All Act, Congress required that

[t]o request a grant under this subchapter, a State or unit of local government shall submit to the Attorney General . . . a certification that *a government entity exists and an appropriate process is in place to conduct independent external investigations into allegations of serious negligence or misconduct substantially affecting the integrity of the forensic results* committed by employees or contractors of any forensic laboratory system, medical examiner's office, coroner's office, law enforcement storage facility, or medical facility in the State that will receive a portion of the grant amount.⁴

The Coverdell Program provides State and local crime laboratories and other forensic facilities with much needed Federal funding to carry out their work both efficiently and effectively. Now, more than ever, as forensic science budgets find themselves on the chopping block in States and localities nationwide, the very survival of many crime labs may depend on Coverdell funds. As the program supports both the capacity of crime labs to process forensic evidence and the essential function of ensuring the integrity of forensic investigations in the wake of serious allegations of negligence or misconduct, we ask that you please provide \$12 million for the Coverdell Program in fiscal year 2014.

FORENSIC SCIENCE RESEARCH AND STANDARDS DEVELOPMENT

The Innocence Project was happy to learn about the establishment of a joint DOJ-NIST National Commission on Forensic Science, and we request that the Subcommittee allocate \$1 million for the Commission to initiate and sustain its work. We also urge the Subcommittee to provide \$3 million directly to NIST to support research for the development of measurement science and standards in support of forensic science. Additionally, we request that the Subcommittee allocate \$5 million to the National Science Foundation to support a forensic science grant program to establish forensic science research centers.

ADDITIONAL NOTE ON THE DEPARTMENT OF JUSTICE'S FISCAL YEAR 2014 BUDGET REQUEST

The Department of Justice's fiscal year 2014 budget request, as it has in previous years, proposes to "block grant" two of the above programs—the Coverdell and Bloodsworth Programs—into a larger DNA Initiative. We are concerned about the impact that zeroing out the Bloodsworth and Coverdell Programs would have both on supporting forensic work that is not specifically DNA related, as well as the requirements and incentives that both programs currently provide for States to prevent wrongful convictions and otherwise ensure the integrity of evidence. Additionally, funding these programs would help to achieve their unique goals of providing access to post-conviction DNA testing for those who have been wrongfully convicted, and providing critically needed support to State and local crime labs to process the significant amount of forensic evidence critical to solving active and cold cases, helping to ensure public safety. The Innocence Project urges the Subcommittee to maintain and fund these two programs by name, in order to continue to prioritize both DNA and non-DNA forensic work, as well as to preserve their important incentive and performance requirements.

Thank you so much for your time and consideration of these important programs.

PREPARED STATEMENT OF THE INDEPENDENT TRIBAL COURT REVIEW TEAM

Thank you for the opportunity to provide testimony today and address the serious funding needs that have limited and continue to hinder the operations of Tribal judicial systems in Indian Country. I am the Lead Judge of the Independent Tribal

⁴42 U.S.C. section 3797k(4) (emphasis added).

Court Review Team. We are here today to request funding for Tribal Courts in the Department of Justice, Office of Justice Programs for the Tribal Courts Assistance Program.

BUDGET PRIORITIES, REQUEST AND RECOMMENDATIONS

Increase funding for Tribal Courts by \$10 million.

Maintain the set-aside for Tribal Courts.

Fully fund all provisions of the Tribal Law and Order Act of 2010.

Fully fund all provisions of the VAWA Act of 2013.

\$58.4 million authorized under the Indian Tribal Justice Act of 1993, Public Law 103-176, 25 U.S.C. 3601 and re-authorized in year 2000 Public Law 106-559 (no funds to date).

We support the 7 percent Tribal set-aside (\$81,375,000) from all discretionary Office of Justice Programs to address Indian Country Public Safety and Tribal Criminal Justice Needs. However, this is not sufficient to address the need in terms of equity for Indian Country relative to funding appropriated for State, local and other Federal justice assistance programs. On behalf of the Independent Review Team, I ask that you give every consideration to increasing this program to the fiscal year 2010 enacted level for the Tribal Assistance Account and allow for greater flexibility for Tribes to use these funds at the local level.

We support an increase in funding for:

- Hiring and Training of Court Personnel.*—Tribal Courts make do with underpaid staff, under-experienced staff and minimal training. (We have determined that hiring Tribal members limits the inclination of staff to move away; a poor excuse to underpay staff.)

- Compliance with the 2010 Tribal Law & Order Act.*—To provide Judges, Prosecutors, Public Defenders, who are attorneys and who are barred, to do “enhanced sentencing” in Tribal Courts.

- Compliance with the 2013 VAWA Act.*—To provide Tribal Courts with the ability to provide non-Indians with all the rights under the U.S. Constitution in domestic violence actions in Indian country.

- Salary Increases for Existing Judges and Court Personnel.*—Salaries should be comparable to local and State Court personnel to keep pace with the non-Tribal judicial systems and be competitive to maintain existing personnel.

- Tribal Courts Need State-of-the-Art Technology.*—(software, computers, phone systems, tape recording machines.) Many Tribes cannot afford to purchase or upgrade existing court equipment unless they get a grant. This is accompanied by training expenses and licensing fees which do not last after the grant ends.

- Security and Security Systems to Protect Court Records and Privacy of Case Information.*—Most Tribal Courts do not even have a full time bailiff, much less a state-of-the-art security system that uses locked doors and camera surveillance. This is a tragedy waiting to happen.

- Tribal Court Code Development.*—Tribes cannot afford legal consultation. A small number of Tribes hire on-site staff attorneys. These staff attorneys generally become enmeshed in economic development and code development does not take priority. Tribes make do with under-developed codes. The Adam Walsh Act created a hardship for Tribes who were forced to develop codes, without funding, or have the State assume jurisdiction. (States have never properly overseen law enforcement in a Tribal jurisdiction.)

- Financial Code Development.*—We have rarely seen Tribes with developed financial policies. The process of paying a bond, for example, varies greatly from Tribe to Tribe. The usual process of who collects it, where it is collected and how much it is, is never consistent among Tribes.

Nationwide, there are 184 Tribes with Courts that receive Federal funding. For the past 7 years, the Independent Court Review Team has been traveling throughout Indian Country assessing how Tribal Courts are operating. During this time, we have completed some 84 court reviews. There is no one with more hands-on experience and knowledge regarding the current status of Tribal Courts than our Review Team.

We have come into contact with every imaginable type of Tribe, large and small, urban and rural, wealthy and poor. What we have not come into contact with is any Tribe whose Court system is operating with financial resources comparable to other local and State jurisdictions. Our research indicates Tribal Courts are at a critical stage in terms of need.

There are many positive aspects about Tribal Courts. It is clear that Tribal Courts and justice systems are vital and important to the communities where they are located. Tribes value and want to be proud of their Court systems. Tribes with even

modest resources tend to send additional funding to Courts before other costs. After decades of existence, many Tribal Courts, despite minimal funding, have achieved a level of experience and sophistication approaching, and in some cases surpassing, local non-Indian Courts.

Tribal Courts, through the Indian Child Welfare Act, have mostly stopped the wholesale removal of Indian children from their families. Indian and Non-Indian Courts have developed formal and informal agreements regarding jurisdiction. Tribal governments have recognized the benefit of having law-trained Judges, without doing away with Judges who have cultural/traditional experience. Tribal Court systems have Appellate Courts, jury trials, well-cared-for Courthouses (even the poorer Tribes), and Tribal Bar listings and fees. Perhaps most importantly, Tribes recognize the benefit of an Independent Judiciary and have taken steps to insulate Courts and Judges from political pressure. No longer in Indian Country are Judges automatically fired for decisions against the legislature.

Assessments have indicated that the Bureau of Indian Affairs (BIA) only funds Tribal Courts at 26 percent of the funding needed to operate. This funding will be critically impacted with the 5 percent reduction and an additional impending rescission of 0.96 percent. The remainder is funded by the Tribes. Tribes who have economic development generally subsidize their Tribal Courts. On the flip side, Tribes who cannot afford to assist in the financial operations of the Court are tasked with doing the best they can with what they have even at the expense of decreasing or eliminating services elsewhere. This while operating at a disadvantage with already overstrained resources and underserved needs of the Tribal members. The assessment suggests that the smaller Courts are both the busiest and most underfunded.

We thank this Committee for the additional \$10.0 million funding in fiscal year 2010. These funds were a Godsend to Tribes. Even minimal increases were put to good use. The additional funding in fiscal year 2014 will be a big asset and coupled with Tribes having flexibility on how to use these funds will greatly improve access to funding for Tribal courts.

The grant funding in the Department of Justice is intended to be temporary, but instead it is used for permanent needs, such as funding a Drug Court Clerk who then is used as a Court Clerk with Drug Court duties. When the funding runs out, so does the permanent position. We have witnessed many failed Drug Courts, failed Court management software projects (due to training costs) and incomplete Code development projects. When the Justice funding runs out, so does the Project.

As a directive from the Office of Management and Budget, our Reviews specifically examined how Tribes were using Federal funding. In the past several years, there were only two isolated incidents of a questionable expenditure of Federal funds. It is speculated that because of our limited resources, we compromise one's due process and invoke "speedy trials" violations to save Tribal Courts money. Everyone who is processed through the Tribal judicial system is afforded their Constitutional civil liberties and civil rights.

We do not wish to leave an entirely negative impression about Tribal Courts. Tribal Courts need an immediate, sustained and increased level of funding. True. However, there are strong indications that the Courts will put such funding to good use.

There are several courts where the roofs leak when it rains and those courthouses cannot be fixed due to lack of sufficient funds. The Team took pictures of those damaged ceilings for the BIA hoping to have additional funds for the Tribes to fix the damaged ceilings.

Tribal Courts have other serious needs. Tribal Appellate Court Judges are mostly Attorneys who dedicate their services for modest fees that barely cover costs for copying and transcription fees. Tribal Courts offer Jury Trials. In many Courts, one sustained Jury Trial will deplete the available budget. The only place to minimize expenses is to fire staff. Many Tribal Courts have Defense Advocates. These advocates are generally law trained and do a good job protecting an individual's rights (including assuring that speedy trial limitations are not violated). This is a large item in Court budgets and if the defense advocate, or Prosecutor should leave, the replacement process is slow.

The need is greater if the Tribal Courts follow the Tribal Law & Order Act of 2010 (TLOA), that requires barred attorneys to sit as judges, prosecutors, defense attorneys, when using the "enhanced sentencing" and enhanced jail detention, options of this Act. Partial funding for TLOA is not an option if Indian Country is expected to benefit from the intent of Congress. We ask that you fully fund the investment you made in Tribal Justice Systems by authorizing both the Tribal Law and Order Act of 2010 and the Indian Tribal Justice Act of 1993. Otherwise the continued lack of resources for Tribal Justice Systems will continue to pose a threat to Native citizens and the future of Indian country.

There is an additional need if the Tribal Courts are to follow the newly enacted VAWA Act of 2013 in domestic violence with jurisdiction over non-Indians in providing the full constitutional rights afforded under the United States Constitution.

We feel it is our duty to submit this testimony and provide these facts on behalf of Tribes' Tribal Courts to advocate for better funding. Tribes ask us to tell their stories. They open their files and records to us and say, "We have nothing to hide." Tell Congress we need better facilities, more law enforcement, more detention facilities, more legal advice, better codes . . . the list goes on and on. But, as we have indicated, it all involves more funding. This Congress and this administration have advanced legislation that improves health and safety for Indian people. However, not fully funding the authorized appropriations in these bills only partially fulfills the intent of the legislation. Put the money where your promises have been!

Finally, we support the requests and recommendations of the National Congress of American Indians.

On behalf of the Independent Tribal Court Review Team, thank you.

PREPARED STATEMENT OF THE LUMMI INDIAN BUSINESS COUNCIL

Good morning distinguished Committee Members and thank you for this opportunity. As an elected official of the Lummi Indian Business Council, it is an honor to speak on behalf of the Lummi Nation and present our appropriation requests for fiscal year 2014 to the Department of Commerce, Justice, Science and Related Agencies.

The Lummi Nation is one of the signatories to the Point Elliot Treaty of 1855. We are located in the northwest coast of Washington State. We have over 5,000 enrolled tribal members with a land base of 25,000 acres with 12 miles of tidelands. We are a fishing community with over 560 registered fishers. Since 1988, we have been at the forefront of the tribal self-governance initiative which includes: BIA and IHS.

Lummi Nation Justice System.—The Lummi Nation has a sophisticated justice system. Our Law Enforcement officers make nearly 4,000 arrests and our courts hold in excess of nearly 5,000 civil and criminal hearings annually. One of the biggest challenges we face is the high cost of incarceration. The Lummi Nation, like most Tribal governments, does not have its own jail facilities. We have developed and implemented an extensive web-based in-home detention system. We are developing a traditional restorative justice model to enable the incorporation of traditional values into our correctional services. This initiative is coordinated with multiple Tribal-wide efforts to restore our traditional values into our contemporary services.

Violence Against Women Act (VAWA) Implementation.—Lummi Nation is requesting that Congress assure all tribes that all available funds are on the table to implement VAWA and the Tribal Law and Order Act (TOLA). We urge the committee to adopt criteria for implementation that provides the maximum flexibility for Tribes. During the implementation phase Tribes need access to all services that are available to State and county governments. This includes but is not limited to the Office of Victims of Crimes and the financial assistance that is available through the crime victim's fund, Federal and State forensic labs, rape kits and sexual assault nurse examiners (SANEs). The Department of Justice should recognize its trust responsibility assumed by the United States of America delegated to the Department of Justice.

VAWA Funding Strategy.—We realize that the reauthorization of VAWA with tribal provisions is an historic landmark for recognizing tribal sovereignty. Therefore, we are prepared to engage in a planning, implementation and enforcement strategy, which identifies and transfers existing non-discretionary funding to the tribes and also identifies shortfall funding gaps.

DEPARTMENT OF JUSTICE RECOMMENDATIONS

We have prepared some recommendations for significant changes in the structure and operations of the Department of Justice to improve its ability to work effectively with Tribal Governments. We believe these recommendations should be one of the Committee's highest priorities.

Indian Justice Bureau (New)

Unlike the Bureau of Indian Affairs or Indian Health Service, the Department of Justice does not have a dedicated Indian bureau office and/or agency to oversee its trust responsibilities and legal obligations to Indian tribes. Which include providing adequate public safety to protect Indian citizens and oversee resources administered

to Indian tribes. Currently, DOJ offers services for 567 tribal governments, which are provided by only three (3) permanent dedicated employees and literally hundreds who have some detailed or recurring partial responsibility. Therefore, we urge the Department of Justice to develop a true government-to-government relationship with all tribes.

Recommended Directives

Direct the Department to begin planning to create an Indian Justice Bureau within the Justice Department which will carry out programs, services and budgetary policies of the Department services and staff from Indian Country working directly with Tribal governments.

The Committee needs to schedule and hold hearings on this request, based on the current Bureau of Indian Affairs Law Enforcement organization structure and policies. We want to urge the committee to make this a high priority.

Direct the Department of Justice and Interior to develop and implement a plan to move BIA law enforcement services to DOJ and employ Indian Preference in all staffing actions. This was presented as Option B in the Report of The Executive Committee for Indian Country Law Enforcement Improvements Final Report, to the Attorney General and the Secretary of the Interior October 1997.

At that time Option A was selected. This option proposed to re-organize the three (3) Bureau of Indian Affairs' Law Enforcement Programs into a single command structure. This option has not addressed the staffing of uniformed officers, training of officers, correctional services and jurisdictional issues that still plague the Department of Interior and Department of Justice Law Enforcement Programs.

Example: Lummi Nation is served by regional BIA law enforcement official, who has done little or no coordination to the Lummi Nation for the past 5 years.

Recruitment of Qualified Tribal Members

There are very few qualified tribal members among the hundreds of DOJ employees responsible to carry out civil and criminal jurisdictional authority in Indian country over members of Indian tribes. These competencies are essential and must be reflected in DOJ's leadership and line positions. No member of an Indian tribe is a Federal judge, a U.S. Attorney, holds a leadership position, or oversees Federal policy or resources for Indian tribes.

Restore Tribal Youth Coordinator—position needs to be recruited and hired. This position provides subject matter expertise to multiple DOJ staff. This position needs to be filled with a person who is experienced and grounded in Indian Communities.

Recommended Directives

Direct the DOJ to create an Indian law training module that enables senior, line and station personnel to work effectively with Tribes. Hundreds of non-Indian senior leaders, FBI agents, U.S. Attorneys and their staff, victim specialists, U.S. Marshals, grants managers, and dedicated Indian staff are not tribal members and need to be educated and trained on how to work with tribes to understand the political relationship and responsibilities.

Create hiring standards that require knowledge of working with Indian tribes and Indian law.

Create a plan for the recruitment and hiring of members of Indian tribes for political and career senior and staff line positions.

Funding Recommendations

Competitive funding awarded to Indian tribes is insufficient to meet their complex jurisdictional issues and social needs.

Recommended Directives and Hearing Requests

Direct the Department to create recurring funding like DOJ provides to State and local governments; create a dedicated Indian program to develop a non-competitive flexible grant program similar to Tribal Self-Governance.

Further we want to request that the committee consider holding hearings for funding strategies that have worked for Indian Country for the past three decades. Self-governance has worked for the Lummi Nation for the past 24 years. We offer our experience and knowledge to work with the Committee to develop these funding solutions.

Consultation

Seek and incorporate input from Tribal governments on Federal operations and policy. Since 1998, after 15 years of being directed by the President to implement a Tribal Consultation Policy, the Department of Justice still does not have one.

Recommended Directives

Direct the Department to implement a DOJ Tribal Consultation Policy reflecting the recommendations provided by the Tribal Nations Leadership Council and the former Tribal Justice Advisory Group.

Make the Tribal Nations Leadership Council a permanent FACA exempt advisory group. National organizations whose governing boards are composed of elected tribal leaders should also receive this exemption.

Apply the intergovernmental exception to all Justice Tribal advisory groups and task forces, representing tribal governments, elected and appointed officials.

Develop recruitment, promotion and hiring policies which highlight the direct experience of working in tribal governments and communities and who are knowledgeable of tribal governance, culture, language, and laws.

These requests are consistent with Tribal Law and Order Act, Section 235 Sub-part "(m) Nonapplicability of FACA.—The Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the Commission."

DEPARTMENT OF COMMERCE RECOMMENDATIONS

Lummi Nation has also developed the following recommendations for the U.S. Commerce Department:

Climate Change

We believe that climate change is a big factor in the decline of our fisheries and our way of life. Some of the factors that contribute to the water crisis are due to climate change. The Lummi Nation has seen increased flooding, increased temperatures, increased erosion, loss of habitat, loss of wild salmon, loss in other species; sturgeon, river smelt, eels, spring Chinook, chum, further we believe this also impacts marine wildlife, eagles, beavers, seals, etc.

The Nooksack River has been a life source for the Lummi Nation and other tribes for their way of living that we are losing. We are witnessing the destruction of the eco-system in the Nooksack River. We need assistance to identify the impact of climate change on our fisheries, housing, land base which is made up of 12 miles of tidelands which produce substantial amounts of shellfish and are particularly susceptible to the negative impact of climate change. Therefore, we are asking the Committee for support in protecting this resource for the Lummi Nation and the next seven generations to come.

State of Art Salmon Hatchery

We believe there is a need for a plan describing the next generation of state of the art salmon hatcheries. We envision energy savings, operational savings, increased production, sustainability for the community. We want to remind the Committee that this hatchery will not only service our community but the 15 user groups that would benefit 500,000 people. We have evidence that our fish have been identified as far south as California and as far north as Alaska. We are requesting financial support for this planning project.

Hy'shqe,
Henry Cagey, Councilmember

PREPARED STATEMENT OF THE MARINE CONSERVATION INSTITUTE

Ms. Chairwoman and Members of the Subcommittee: Marine Conservation Institute, based in Seattle, WA, is a nonprofit conservation organization that uses the latest science to identify important marine ecosystems around the world, and advocates for their protection for us and future generations. I wish to thank the members of the subcommittee for the opportunity to submit written testimony on the fiscal year 2014 appropriations in regards to the National Oceanic and Atmospheric Administration (NOAA). NOAA's satellite and weather programs are vital to alerting citizens about oncoming weather events; however, these programs should not continue to be funded at the expense of NOAA's ocean and coastal activities. Marine Conservation Institute supports \$35.5 million in additional funding (compared to previously enacted levels) to restore support to a select few ocean programs mentioned below.

NOAA is one of the premier science agencies in the Federal Government and provides decision makers with critically important data, products, and services that promote and enhance the nation's economy, security, environment, and quality of life. According to the National Ocean Economics Program, the U.S. ocean economy contributes more than \$258 billion to our nation's Gross Domestic Product through fisheries and seafood production, tourism, recreation, construction, and transpor-

tation. Additionally, over 2.7 million jobs in the U.S. depend on the marine environment.¹ NOAA's programs are critical to protecting ocean health for sustained use and long term survival of its wildlife.

I would like to highlight a few programs that Marine Conservation Institute believes are essential to NOAA's conservation mandate.

NATIONAL MARINE SANCTUARIES

National marine sanctuaries preserve biologically and culturally important areas of our nation's oceans for us and future generations. Presently, the Office of National Marine Sanctuaries (ONMS) is responsible for managing the nation's 13 marine sanctuaries and Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands.

Our marine sanctuaries support thousands of coastal businesses, protect underwater and maritime treasures, and provide ocean recreation, research, and education for the public. For example, more than 400,000 visitors to the Florida Keys sanctuary spent over 2 million person-days of recreational fishing in 1 year and spent \$274 million in nearby counties.

Continued underfunding will force ONMS to cut treasured public access and recreation opportunities, cancel collaborative efforts with museums and universities, and dismantle successful education initiatives that benefit local communities.

Marine Conservation Institute recommends \$60.5 million in fiscal year 2014. This amount includes \$55 million for the operations and research account, and \$5.5 million for the construction account. This would allow ONMS to better fulfill its responsibilities, particularly as ONMS is being asked to do more with less. For example, in 2013 the Marine Protected Area Center was subsumed by the ONMS and the National Marine Sanctuary of American Samoa was expanded by 13,580 square miles; however, additional resources have not been allocated to cover these responsibilities.

PACIFIC MARINE NATIONAL MONUMENTS

Three marine national monuments (Pacific Remote Islands Marine National Monument, Rose Atoll Marine National Monument, and Marianas Trench Marine National Monument) were established in 2009 by President George W. Bush in the Pacific Ocean. Together with Papahānaumokuākea Marine National Monument (established in 2006), they protect approximately 331,797 square miles of spectacular marine habitat.

Compared to other marine ecosystems, the marine monuments ecosystems are relatively intact and rich in biodiversity. These areas include some of the most pristine tropical islands and coral reef ecosystems in the world and contain vast amounts of shallow-water reef-building coral species, hundreds of fish species, and dozens of species of seabirds. Mostly uninhabited, the marine monument waters are relatively free from the problems plaguing many other marine ecosystems: over-exploitation, disturbance, and pollution. Using these remarkably intact tropical ecosystems, we are developing an understanding of what healthy and productive places really look like which is helping to identify negative impacts to marine ecosystems closer to home and showing us the benefits of restoration.

With the establishment of the monuments came the responsibility of developing and implementing appropriate management measures to adequately protect these biologically and historically significant areas. Without sufficient and sustained resources, NOAA cannot adequately protect these areas from illegal fishing, invasive species, vessel groundings and other threats. Continued budget cuts will reduce critical research and outreach grants to university scientists and non-Government organizations and lessen the United States' ability to share information and ideas with other Pacific island nations about monitoring climate change, conserving endangered and threatened species, and developing remote surveillance capabilities. Therefore, Marine Conservation Institute recommends \$3 million for the Pacific Marine Monuments Program in fiscal year 2014.

HAWAIIAN MONK SEAL RECOVERY

NOAA has responsibility for reviving populations of the Hawaiian monk seal, one of the most critically endangered marine mammals in the world. It is also the only marine mammal whose entire distribution range lies within our national jurisdiction; thus the U.S. has sole responsibility for its continued survival. Over the last 50 years, the Hawaiian monk seal population has experienced a severe decline of

¹National Oceanic and Atmospheric Administration. Economics: National Ocean Watch (ENOW). 2013. www.csc.noaa.gov/digitalcoast/data/enow (accessed March 4, 2013).

60 percent, and now the population is slightly more than 1,000 individuals. Various factors have contributed to the seal's decline including: human hunting of the species to near extinction in the mid-1800s; entanglement in marine debris; being hooked or entangled by fishing gear; loss of habitat for pupping and resting; and competition for food in the Northwestern Hawaiian Islands; to name a few.

There is reasonable hope for the monk seal if a small subpopulation in the main Hawaiian Islands can continue to grow. However, this population growth has generated increased conflicts with recreational fishermen who unintentionally hook or entangle monk seals. In 2012 alone, there were 15 confirmed hooking incidents, and three died as a result. Hostility toward the seal has become toxic in some communities, prompting at least four intentional seal killings on Kaua'i and Moloka'i in a little over a year.

It has been conservatively estimated that 30 percent of the monk seals alive today are due to direct actions by NOAA and its partners.² However, we are concerned that funding for the monk seal has severely decreased in recent years (a level as low at \$2.7 million in 2011). Furthermore, our analysis indicates that cuts to the monk seal program have been disproportionate compared to other marine mammal species under NOAA's jurisdiction.

Lower funding levels in recent years have already severely affected recovery efforts by reducing field camps essential for population monitoring and seal protection; hampering critical community liaison efforts to explore and explain the importance of the monk seal in Native Hawaiian culture; removing specialists who eliminate sharks preying on seal pups; and diminishing research programs that develop mitigation measures for fisheries interactions and other human-seal interactions. Marine Conservation Institute strongly recommends the subcommittee moderately increase funding to \$4.5 million in fiscal year 2014 to begin to reinstate NOAA's lost capability to recover the species.

LAW ENFORCEMENT

NOAA's Office of Law Enforcement (OLE) is responsible for enforcing the laws that conserve and protect our nation's fisheries, threatened and endangered species, and marine sanctuaries and monuments. The office is also responsible for enforcing the United States' international commitments to fight illegal, unregulated and unreported (IUU) fishing (also called "pirate fishing"), a practice that threatens to undermine global fish stocks, such as the Pacific tuna fishery in which the U.S. participates. IUU fishing also affects U.S. fishermen and fishing communities by reducing opportunities and prices for fish here at home.

NOAA's jurisdiction spans 3.4 million square miles of coastal and marine environments, including the nation's 13 marine sanctuaries and 4 marine national monuments mentioned above. The Pacific region alone poses a huge challenge for NOAA OLE because it covers 1.5 million square miles, nearly one-half of the U.S. Exclusive Economic Zone.

The most recent analysis indicates that the U.S. commercial fishing alone contributed \$7.3 billion to the U.S. Gross Domestic Product. However, over a quarter of the U.S. fish stocks are over-exploited. Additionally, as fish stocks decline worldwide, the threat of foreign poaching of U.S. fishing stocks becomes greater, particularly in remote areas. Officials estimate the global value losses from IUU fishing ranges between \$10 billion and \$23.5 billion annually. For domestic and international fish stocks to recover, strict regulations and increased enforcement must be put in place, particularly in remote areas such as the Pacific marine monuments.³

Marine Conservation Institute strongly supports \$67.7 million for NOAA's Office of Law Enforcement in fiscal year 2014. This will allow OLE to maintain current capabilities, while also providing modest additional funding to the Pacific Region for the added responsibility of protecting the marine monuments from IUU fishing by foreign fleets.

MARINE OPERATIONS AND MAINTENANCE

The Office of Marine and Aviation Operations (OMAO) operates NOAA's fleet of specialized ships to fulfill the agency's environmental and scientific missions. OMAO provides vessels for fisheries research, oceanographic and atmospheric research, and hydrographic surveys. Ships are also used for monitoring marine sanctuaries and

²McAvoy, Audrey. "Feds—Efforts to rescue monk seals helping species." Associated Press in West Hawaii Today, January 26, 2012.

³National Oceanic and Atmospheric Administration. Illegal Fishing: Not in Our Ports, 2012. http://www.nmfs.noaa.gov/ia/iuu/portstate_factsheet.pdf (Accessed July 7, 2012).

monuments, and servicing the early warning tsunami and weather system equipment.

Not since 2007 has OMAO operated its ships at full capacity, largely due to budget constraints. In 2012, NOAA's 17 fully operational vessels were at sea for an average of 158 days each, which is about 72 percent of the fleet's operational capability (max = 220 days per vessel). However, NOAA's program offices had to "buy" 19 percent of the total days-at-sea to fulfill some of their basic mandates. For instance, the National Marine Fisheries Service purchased 396 days in fiscal year 2012.⁴ Unfortunately, the line offices are experiencing budget constraints as well.

A substantial cut would also hinder NOAA's ability to meet important fishery management provisions of the Magnuson-Stevens Fishery Conservation and Management Act which support our fishing industry and communities and the Marine Mammal Protection Act.

It makes no sense for NOAA's ships to be partially idle when one of NOAA's primary missions is to manage and restore our oceans. Marine Conservation Institute supports \$175.5 million for OMAO in fiscal year 2014. This is a step toward more fully funding NOAA's fleet in order to fulfill its mandates.

In summary, Marine Conservation Institute respectfully requests that the subcommittee maintain or slightly augment funding for the conservation side of the NOAA budgets by the amounts discussed above.

Respectfully,
Emily J. Douce

PREPARED STATEMENT OF THE NATIONAL ASSOCIATION OF MARINE LABORATORIES

Madam Chair, Ranking Member Shelby and Members of the Subcommittee, my name is Jo Ann Leong and I am the director of the Hawaii Institute of Marine Biology at the University of Hawaii. I submit this statement as President of the National Association of Marine Laboratories (NAML).

NAML recommends the following actions to help maintain the health of the nation's ocean, coastal, and Great Lakes research and education enterprise:

- Maintain strong support for extramural investigator-initiated research and education programs within NSF, NOAA and NASA by supporting the administration's research budget requests for these agencies;
- Support the NOAA Science Advisory Board's recommendations for increased use of extramural research programs as part of the effort to strengthen the health of the NOAA R&D portfolio;
- Reject the administration's proposal to terminate STEM education funding in the mission agencies, including:
 - NOAA (specifically Sea Grant's STEM education funding including the Sea Grant Knauss and the Sea Grant-NMFS Fellowships and the other education programs administered by the NOAA Office of Education);
 - NASA (and its informal education programs);
 - the Environmental Protection Agency (the EPA graduate fellowship STAR program and the Greater Research Opportunities Undergraduate Student Fellowships); and
 - the National Institutes of Health (Science Education K-12 Program).
- Support efforts to incorporate NAML labs as sites for complementary marine and coastal networks to allow for the sharing and integration of data and observations leading to more cost effective research, increased access to valuable technical assistance, and an improved understanding of the relationships among and between multiple ecosystems; and
- Support an innovative and cost saving national partnership effort to co-locate Federal scientists and their research infrastructure at NAML sites and facilities.

NAML is grateful to this subcommittee for the long-standing support it has provided for ocean, coastal, and Great Lakes research and education through the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), and the National Aeronautics and Space Administration (NASA).

THE ROLE OF MARINE LABORATORIES IN THE NATION'S RESEARCH AND EDUCATION ENTERPRISE

NAML is a nonprofit organization of member institutions representing coastal, marine, and Great Lakes laboratories in every coastal State, from Guam to Ber-

⁴National Oceanic and Atmospheric Administration—FY 2012 Fleet Allocation Plan. 2012. <http://www.omao.noaa.gov/shipallocation.html> (Accessed July 9, 2012).

muda and Alaska to Puerto Rico. NAML laboratories conduct research and provide education and public service programs to enable local and regional communities to better understand and manage their ocean, coastal and Great Lakes cultural and natural resources. The member institutions of NAML work together to improve the quality, effectiveness and relevance of ocean, coastal and Great Lakes research, education and outreach. Locally, NAML labs provide accessible, reliable, and relevant information to support wise coastal management and the understanding and protection of natural resources, nationwide.

OCEANS, COASTS, AND GREAT LAKES ARE VITAL FOR ECONOMIC GROWTH AND THE WELL-BEING OF THE NATION

The ocean is a major economic asset. For example, in the U.S. and using 2010 statistics, 52 percent of the population lived in coastal watershed regions generating nearly 60 percent of the nation's GDP in 2010. Most imported goods (over \$1.2 trillion/yr.) and exports moved through coastal waterways and ports. Commercial fishing generated over \$32 billion in income and more than one million jobs, while recreational fishing supported \$19 billion in income and millions of additional jobs. Over 25 percent of U.S. domestic oil was produced from coastal and offshore waters. Oil refineries and wind farms, military installations and assets, rail and road networks, all crucial for national security, energy, commerce, and transportation, are concentrated along coasts. In our globally connected world, land-locked nations derive many benefits from the ocean such as general commerce and ocean products, and are impacted by the ocean's influence on the distribution of rainfall and heat.

Meeting stewardship responsibilities for the oceans, coasts, and the Great Lakes requires a robust ocean and coastal research and education enterprise. Coastal areas face challenges that threaten our fisheries resources, impact recreational and commercial resources and impact ecosystems. We must reinvest in the nation's research enterprise that has been responsible for our long-term prosperity and technological preeminence through interdisciplinary research spanning a landscape of disciplines, from physics to geology, chemistry to biology, engineering to social sciences, and modeling to observation.

RECOMMENDATIONS REGARDING FEDERAL MARINE AND COASTAL RESEARCH AND EDUCATION

NAML believes that research and education programs at the major Federal science agencies with marine portfolios—including the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), and the National Aeronautics and Space Administration (NASA)—should be viewed as priority investments in the future health and well-being of the Nation. While much attention has been justifiably focused on the need for our Nation to continue its support of premier basic research programs, it is equally important to maintain strong support for mission-oriented ocean, coastal, and Great Lakes research, observing, monitoring, and education programs. Programs that enhance agency internal research capabilities and support the extramural community in competitive, merit-based research provide highly cost-effective returns on investment and distribute economic and societal benefits over a broad array of communities.

Existing education and outreach programs focus on connecting experts in marine and coastal research with students, educators, and citizens who benefit from the knowledge provided and by personal contact with those conducting the research. There is a real concern that the centralization of some of these education and outreach programs proposed by the administration in the fiscal year 2014 budget request will both sever those connections and likewise dumb-down science while making real scientific understanding inaccessible to those who the programs are meant to serve.

National Science Foundation.—NSF funds vital basic research that enhances the public understanding of the Nation's oceans, coasts, and Great Lakes. NSF also supports science, engineering and education to inform the societal actions needed for environmental and economic sustainability and sustainable human well-being. A sustainable world is one in which human needs are met equitably and without sacrificing the ability of future generations to meet their needs. Meeting this challenge requires a substantial increase in our understanding of the integrated system of society, the natural world, and the alterations humans bring to Earth. NSF's Science, Engineering, and Education for Sustainability (SEES) initiative (including efforts such as the Coastal SEES initiative, ocean acidification, dimensions of biodiversity, sustainable energy pathways, water sustainability and climate, etc.) is an example of how this vital need is being met. Research in this area as well as in other ocean and coastal areas is supported via a highly competitive, merit-based process through

a variety of modes of support at NAML labs involving individual investigators, small interdisciplinary teams of researchers, and students.

NAML is particularly supportive of the creation of new research networks that connect NAML labs and other entities in ways that would further enhance other ecosystem networks supported by NSF. NAML believes that research infrastructure support is needed to move the research enterprise forward and therefore we continue to support the longstanding modest program that provides competitive support via the Field Stations and Marine Laboratories (FSML) program. On the broader issue of national infrastructure support, NAML is concerned, however, that in an era of particularly scarce resources, an appropriate balance must be achieved that protects as much as possible that part of the portfolio that supports the actual conduct of research and training so that it does not become overshadowed by larger scale infrastructure efforts.

National Oceanic and Atmospheric Administration.—NOAA is a critical Federal leader in ocean, coastal and Great Lakes research and education. NOAA's extramural support for research and education at marine labs and universities greatly expands its access to world-class expertise and unique facilities, complementing and expanding the work carried out within NOAA labs. NOAA's extramural partnerships contribute invaluable information to our coastal resource managers. These include: the National Sea Grant College (NSGC) Program and Coastal Services Center; Aquaculture Initiatives; Prescott Marine Mammal Program; Highly Migratory Shark Fishery Research Program; NOAA Cooperative and Joint Institutes; the Integrated Ocean Observing Systems; NOAA's Center for Sponsored Coastal Ocean Research harmful algal bloom, hypoxia, and ecological forecasting initiatives; the National Estuarine Research Reserve System; the National Marine Sanctuary Program; and NOAA's Office of Education.

NAML urges the Subcommittee to reiterate its support for these important extramural programs as well reject, again, the administration's plan to terminate the National Undersea Research Program, the Prescott Marine Mammal Program, and the STEM education programs in the Office of Education and the Sea Grant program (i.e. the Knauss Fellowships and the Sea Grant-NMFS Fellowships) which are all tightly integrated with the mission of the agency and the research activities that NOAA supports.

NAML strongly supports recent recommendations made to the NOAA Science Advisory Board that calls for priority support for NOAA extramural programs. Increased extramural research enables NOAA to leverage its R&D investment with the resources of the nation's leading university scientists resulting in greater and faster scientific advances at lower costs. A predictable and reliable partnership with the extramural research community is critical to NOAA's long-term success. As available resources become scarcer and major program reorganization is being considered, NOAA should enhance its partnership with the extramural research community in creative and innovative ways. NOAA should expand its efforts to co-locate agency research staff and infrastructure at non-Federal marine labs. Such actions will not only result in significant cost savings, achieve a greater return for its investment, and increase scientific collaborations and productivity. A robust NOAA budget directly coupled with solid support for extramural partnerships is essential for NOAA to serve national needs.

National Aeronautics and Space Administration.—Part of NASA's mission is to develop an understanding of the total Earth system and the effects of natural and human-induced changes on the global environment. Oceans play a major role in influencing these changes. Long-term ocean data from satellites make it possible to employ modeling techniques for global mapping of seasonal changes in ocean surface topography, currents, waves, winds, phytoplankton content, sea-ice extent, rainfall, sunlight reaching the sea, and sea surface temperature. Studying these patterns at a global scale can help forecast and mitigate the effects of floods and drought. Ocean observing satellite images tell us about the most fundamental climate changes. Satellite data have improved forecasting model capabilities to predict events such as El Niño and other global and regional climate cycles. Expanding NASA extramural support will further develop the ability to better predict ocean phenomena.

Education, Diversity and an Ocean Literate America.—The U.S. continues to be at risk with respect to student achievement in science, technology, engineering and math among industrialized nations, as well as, emerging industrializing nations. Therefore, it is critically important that we improve ocean literacy and workforce development among all sectors of our diverse nation. NAML labs seek to expand the engagement of individuals from groups that have been historically under-represented in ocean research, education and outreach through their own and university programs at marine laboratories. This is particularly important in fulfilling the goal of achieving a diversified STEM pipeline for future science and ocean workforce

needs. Marine laboratories play an important role in formal and informal education and workforce development by providing students with a place to learn. Marine labs serve as primary training grounds for experiential ocean education and are committed to enhancing diversity within the field of ocean, coastal and Great Lakes research and education.

NAML laboratories continue to strongly support partnerships with Federal agencies to address the ocean education needs of the Nation as an integral part of the research enterprise. These include the NSF's Louis Stokes Alliance for Minority Participation, Centers for Ocean Science Education Excellence, Research Experiences for Undergraduates, and Research on Learning in Formal and Informal Settings programs; NOAA's Expanding Partnerships Program in the NOAA Education Office and the National Sea Grant College Program—including the Knauss and Sea Grant-NMFS Fellowships. The importance of marine labs in support of coastal States' Environmental Literacy Plans is essential in developing a literate public.

It is important that Federal research agencies continue to integrate their research and education programs and maintain their support and involvement in formal and informal learning at all age levels, by all disciplines, and for all Americans. Therefore we call on the Subcommittee to reject the administration's proposal to terminate the mission agencies' support for education as part of the administration's STEM consolidation proposal.

Thank you for the opportunity to express our concerns. We would be happy to provide additional information if it would be helpful to the Subcommittee.

PREPARED STATEMENT OF SEARCH, THE NATIONAL CONSORTIUM FOR JUSTICE INFORMATION AND STATISTICS

Introduction.—Subcommittee members, thank you for the opportunity to submit written testimony regarding the Department of Justice (DOJ) funding to be provided for in the fiscal year 2014 Commerce, Justice, Science, and Related Agencies appropriations bill. SEARCH recommends the National Criminal History Improvement Program (NCHIP) receive an appropriation of \$50 million and that the National Instant Criminal Background Check System (NICS) Act Record Improvement Program (NARIP) receive an appropriation of \$25 million.

SEARCH, The National Consortium for Justice Information and Statistics (SEARCH), is a nonprofit membership organization created by and for the States. SEARCH's Governor-appointed, dues-paying members from each of the 50 States and territories have the responsibility, among other things, to oversee both NCHIP and NARIP within their States.

Over the years, States have made great strides in meeting their criminal history record improvement goals under both programs, despite severely limited funding levels for each program. SEARCH recognizes that these are difficult budgetary times that have strained investments in criminal history improvement over the past several years.

There is still work to be done to realize a truly complete and accurate national criminal history background check system. That system informs a variety of critical public safety decisions, as well as non-criminal justice decisions, such as those regarding applicants for employment and licensing, to volunteers who work with children and other vulnerable populations, to individuals purchasing firearms. In light of recent, tragic events due to gun violence, and the simultaneous demand for accurate, complete and timely criminal records for a range of decisions, there should be a priority placed on NCHIP and NARIP funding.

NCHIP AND NARIP: CRITICAL INVESTMENTS FOR PUBLIC SAFETY DECISIONMAKING

It is important to note that both NCHIP and NARIP each focus on improvements to the efficiency, effectiveness, timeliness and accuracy of criminal history record and associated data for decisionmaking purposes. However, each program emphasizes specific and distinct goals, while also complementing one another. NARIP funding has been heavily focused on enhancing decisionmaking for firearms purchases, such as increasing the number of disqualifying mental health records available to the system. NCHIP is focused on a broader range of criminal history improvements that individual States have prioritized (improving arrest and disposition matching, increasing conviction record availability in the Federal systems, etc.). These improvements benefit the system as a whole, and impact all criminal and non-criminal justice decisions, as well as firearms purchase decisions. Perhaps most significantly, by current law, only 20 States qualify for NARIP funding to improve

their contributions to NICS.¹ States that cannot qualify for NICS funding will be significantly hampered in their efforts to help improve the nation's criminal history record system if they cannot access sufficient resources via NCHIP. Thus, the majority of the States rely on NCHIP for criminal history record and repository improvements related to all criminal and non-criminal justice decisionmaking.

As such, SEARCH recommends that Congress invest in background screening for firearms purchases by supporting President Obama's budget proposal of \$50 million for NCHIP. Meanwhile, SEARCH also advocates continuing funding for NARIP, but at an increased level of \$25 million, which will allow States that have met the grant program qualifications to use that funding for targeted efforts to improve records for firearms purchase decisions.

INVESTMENT IN BOTH PROGRAMS IS CRITICAL TO SUCCESS

Since the recent tragedies in Aurora, Colorado, and Newtown, Connecticut—compounded by the nearly daily reports of gun-related violence—significant focus has been placed on the nation's background screening system for firearms purchases: NICS. Some of that focus has been mistakenly critical of the States and their contributions to the databases used for such screening. Indeed, the vast majority of records used to make firearms transfer determinations are records maintained and made available by the States. Thus, the overwhelming majority of firearms transfer denials are based on State records. States have made their records available despite facing many extraordinary, and well-documented, obstacles to effectively sharing information at the national level and in support of this national system.

Those obstacles include lack of sufficient investment² to help build the infrastructure for electronic information sharing, continuing challenges with making disqualifying records (such as felony convictions) available to NICS, and significant policy challenges (particularly with sharing mental health records). NICS has been very successful in denying the sale and transfer of guns to those prohibited from having them. The States and FBI rely on NICS for robust decisionmaking on daily firearms transactions. There are, however, opportunities for improving the timeliness and availability of information to NICS that could be addressed by targeted funding. For example, there are still millions of records related to felony convictions, under indictment/information, fugitive from justice and drug abuser prohibiting categories that are not always available to NICS. With a more substantial investment in NCHIP, States will be able to address priority issues that are standing in the way of full records sharing.

It is important to note that the need for additional funding is not dependent on the expansion of the background checking system; it is to improve the system's effectiveness for existing requirements related to background screening for firearms purchases.

SEARCH urges the Committee to make a meaningful investment in building our nation's capabilities to effectively conduct background screening for firearms purchases. For that investment to be successful, it should also remove the roadblocks to successful State participation and develop strategies to improve the availability of disqualifying records to the NICS Index. With a \$50 million investment in NCHIP in fiscal year 2014, States that qualify for the funding will be able to concentrate on criminal history record priorities that would allow them to increase their record contributions to NICS.

It is also critical that decisionmakers ensure all States receive or are eligible for grant funding to support improvements to NICS—based on incentives, not penalties—and that new funding is authorized and appropriated for this work. It is likely that many States will not meet the “relief from disabilities” requirement attached to NARIP funding. While SEARCH does not have a policy position on this requirement, to disqualify States from funding to improve their criminal history record system only weakens the potential for a national system that provides the most complete, accurate, and timely records to inform critical decisionmaking. The fact that more than half of the States do not qualify for NARIP makes NCHIP that much more important.

¹ NARIP has two main requirements: States must (1) establish a process where those adjudicated as “mentally defective” can seek to reinstate their right to purchase a firearm, and (2) comply with a process to estimate the number of NICS disqualifying records they maintain. Only 20 States have met requirement #1.

² Both NCHIP and NARIP funding have suffered over the past several years and each have only been funded at a very small percentage of their authorized levels.

EXAMPLES OF STATE SUCCESS

NCHIP's broad objective is to enhance the criminal justice capabilities of State governments by improving the accuracy, completeness and timeliness of criminal history records. These State systems support Federal records systems, including the Federal Bureau of Investigation (FBI) Interstate Identification Index (III).³ Indeed, 70 percent of all III records are maintained by the States and 30 percent are maintained by the FBI.⁴ The operational enhancements fostered by NCHIP funding continue to motivate improved public safety on both a State and national level.

The Vermont Department of Public Safety has a long history of participation in the NCHIP grant program and the funds have been critical in driving advances in the access and completeness of criminal history information. The initial conversion of State criminal history records from paper to electronic format would not have been possible without NCHIP, nor would the conversion to a standard database format in the following years. Other technical achievements include implementing the Global Justice XML Data Model, National Standardized Rap Sheet, Interstate Identification Index and the National Fingerprint File program. Outcomes fostered by NCHIP have not been limited to technical upgrades. For example, Vermont's criminal history database was updated with multiple years of missing court disposition information with NCHIP funding.

Alaska has been a recipient of NCHIP for several years. Funding has allowed the State to automate various system interfaces, implement charge tracking systems, develop uniform offense citations, and locate and add nearly 4,000 missing dispositions critical to NICS. With NCHIP funds, the State has also conducted recidivism studies and implemented Live Scan stations, which raised compliance rates from 56 percent to over 90 percent mandatory fingerprinting at the Anchorage courthouse during the 2-year pilot project. Funds also helped the State institute electronic sharing of automated court criminal records.

The Kentucky State Police (KSP) recently used NCHIP funding for a number of enhancements, including collection and electronic storage of disposition documents, a quality control application and security enhancements for court dispositions, transmission of State prison commitment information, and to process the disposition backlog. All of these initiatives improve the accuracy, consistency and volume of records available in Kentucky's computerized criminal history system, which ultimately allows for increased participation in III, NICS and Identification For Firearms Sales.

AN INVESTMENT IN IMPROVEMENT IS KEY

NCHIP has suffered over the past several years due to considerably reduced funding. In fiscal year 2010 congressional appropriations were approximately \$12 million for this program, dropping to \$10 million in fiscal year 2011, and to \$6 million in 2012. In fact, the program has been so significantly under-funded that some States no longer receive any allocation from the NCHIP grants. Because State criminal history records are the primary source for the FBI III database, any constraints on the States weakens the ability of many Federal programs to identify threats and keep our nation safe. Meanwhile, despite the NARIP authorization of \$1.25 billion for fiscal year 2009–2013, congressional appropriations have been a small fraction of that (\$20 million, \$17 million, and \$5 million in fiscal year 2010–2012, respectively). Meanwhile, the U.S. Department of Justice's Bureau of Justice Statistics (BJS)—which administers the grant program—received grant applications requesting funding far above the amounts appropriated.

Today, the accuracy, completeness and reliability of the nation's criminal history record system is more important than ever before, for law enforcement investigations; officer safety; sentencing and other criminal justice purposes; for expungement and other reentry strategies; for homeland security and anti-terrorism purposes; for public non-criminal justice purposes, such as security clearances and employment suitability; and for research and statistical programs that provide critical guidance for justice assistance decisions and for shaping law and policy. Without an adequate level of funding for the States, the quality of criminal records available nationwide will continue to be negatively impacted.

³The Interstate Identification Index is the national system designed to provide automated criminal history record information of Federal offenders and records of offenders submitted by all States and territories.

⁴Survey of State Criminal History Information Systems 2010, Bureau of Justice Statistics, U.S. Department of Justice, Office of Justice Programs (November 2011) (<https://www.ncjrs.gov/pdffiles1/bjs/grants/237253.pdf>).

CONCLUSION

SEARCH thanks the Chair and members of the Subcommittee for their steadfast support of these programs in the face of daunting budget challenges. Given the reliance on criminal history record systems for critical decisions that keep our citizens safe from guns, predators, terrorists and other criminals, it is a worthwhile and needed investment.

We urge Congress to make a substantial investment in the Federal-State criminal background screening partnership that comprises the national instant criminal background check system. It is a critical tool in the fight against gun violence, but funding for its improvement must envision a national scope that is inclusive of all the States. As the States' examples noted, their successes with information sharing would not have been possible without the support of NCHIP and NARIP funding. Meaningful NCHIP and NARIP funding will more broadly improve this nation's criminal justice information sharing backbone. And the Federal investment can be leveraged many times over by contributing to the ability of State and local criminal justice agencies to provide timely, accurate and compatible information to Federal programs such as III.

On behalf of SEARCH, its governors' appointees, and the thousands of criminal justice officials who participate in the SEARCH network and who benefit from SEARCH's efforts, thank you for your support.

PREPARED STATEMENT OF THE NEW ENGLAND OCEAN ACTION NETWORK

Dear Chair Mikulski and Ranking Member Shelby: The undersigned members of the New England Ocean Action Network (NEOAN) believe that creating a comprehensive plan for New England's ocean and coasts has the potential to minimize user conflicts in an increasingly crowded ocean, protect the economic value of New England's fisheries and restore the health of our marine ecosystems. Therefore, we are submitting the attached programmatic funding request for \$10 million for Regional Ocean Partnership Grants within NOAA's budget for the Commerce, Justice, Science and Related Agencies Appropriations Subcommittee. Regional Ocean Partnership Grants funding is an essential part of NOAA's budget, and one upon which regional ocean management initiatives in New England rely. We believe that Regional Ocean Partnership Grant funding is important for New England, and we ask you to include this program as an appropriations priority in the Commerce, Justice, and Science Appropriations Subcommittee on the fiscal year 2014 budget.

The Regional Ocean Partnerships Grants program supports the Northeast Regional Ocean Council (NROC), a State-Federal partnership that is the hub for development of the Nation's first regional ocean plan. NROC was formed in 2005 and now has the support of the governors of New Hampshire, Vermont, Massachusetts, Maine, Rhode Island and Connecticut. Today, all six States' governors continue to participate in this important partnership. NROC works directly with the 11 Federal agencies to better manage the impacts of increasing human uses, to better plan for disasters and prevent recurring future damages, and to use the best scientific information so Massachusetts can achieve its economic goals and maintain a healthy ocean.

The northeast region was awarded \$1.545 million in fiscal year 2011 and \$625,000 in fiscal year 2012 in Regional Ocean Partnership funding. This critical funding has been used to engage important stakeholders in the region, develop data and science products, and begin creation of a regional ocean plan. Continued funding is needed to create regional products like the Northeast Ocean Data Portal (an interactive data tool) and the Northeast Recreational Boater Survey, which provide the tools needed to integrate environmental needs with existing and emerging human uses and ensure full public participation to reduce user conflicts.

Traditional ocean industries such as fishing, shipping, tourism and recreation are all critical parts of New England's economy. The same ocean now has potential to launch new jobs in growing industries such as aquaculture and renewable energy. However, these new ocean industries should not be developed at the expense of the businesses and communities that rely on access to a healthy ecosystem for their livelihoods. Comprehensive ocean planning, which gives existing ocean industries and stakeholders a real voice in the development of a plan, could help us find the right locations and develop the kind of appropriate mitigation measures that will allow new and existing industries to thrive side by side.

Thank you for your kind consideration of this request.

Sean Cosgrove, Director of Campaigns, Conservation Law Foundation, Boston, Massachusetts	Berl Hartman, Director, Environmental Entrepreneurs, New England Chapter, Cambridge, Massachusetts
Jack Clarke, Director of Public Policy & Government Relations, Mass Audubon, Boston, Massachusetts	Megan Amsler, Executive Director, Cape & Islands Self Reliance, Cataumet, Massachusetts
Richard Nelson, Lobsterman and Captain, F/V Pescadero, Friendship, Maine	Marcia Wilkins, Chapter Conservation Chair, Sierra Club, Connecticut Chapter, Connecticut
Nick Battista, Marine Programs Director, Island Institute, Rockland, Maine	Jamie Rhodes, Director, Clean Water Action Rhode Island, Providence, Rhode Island
Susan Little Olcott, Outreach Manager, CMSP, Ocean Conservancy, Brunswick, Maine	Richard Delaney, President and CEO, Provincetown Center for Coastal Studies, Provincetown, Massachusetts
Melissa Gates, Northeast Regional Coordinator, Surfrider Foundation, Rockland, Maine	Dan Pingaro, Chief Executive Officer, Sailors for the Sea, Newport, Rhode Island
Meghan Jeans, Director, Fisheries and Aquaculture Programs, New England Aquarium, Boston, Massachusetts	Rob Moir, President and Executive Director, Ocean River Institute, Cambridge, Massachusetts
Noona Joseph, Chair, Surfrider Foundation, Massachusetts Chapter, Somerville, Massachusetts	Jonathan Stone, Executive Director, Save the Bay, Providence, Rhode Island

PREPARED STATEMENT OF THE NATIONAL ECOLOGICAL OBSERVATORY NETWORK, INC.

My name is Dr. Russell Lea and I am the Chief Executive Officer of NEON, Inc. I appreciate the opportunity to submit this statement to the Subcommittee to ask for your support for the President's Budget Request for the National Science Foundation for fiscal year 2014 and the National Ecological Observatory Network (NEON) that is included in the request for the Major Research Equipment and Facilities Construction Account. The administration's request for NEON in fiscal year 2014 is \$98.2 million.

On behalf of the scientific community who will be using NEON, I would like to express our appreciation for the strong support that Congress has consistently provided NSF, and in particular the NEON project and core funding for NSF's Biological Sciences Directorate. Sustained investments in science and technology are critical for a knowledge-intensive economy and for maintaining U.S. scientific leadership. To this end, the MREFC account was designed to fund unique, transformational research infrastructure at the frontiers of science and engineering.

NEON is a world-class distributed environmental Observatory that is a prime example of such infrastructure. NEON sites are located throughout the United States. Sites in the vicinity of Washington, DC, include the Blandy Experimental Farm located in Virginia's Congressional District 10, the nearby Smithsonian Conservation Biology Institute, and the Smithsonian Environmental Research Center in Maryland.

Planning and Building the Observatory.—NEON has undergone a series of rigorous reviews mandated by NSF's Major Facilities Office. NSF has clearly promulgated its "no-cost overruns" policy with regards to the construction of facilities like NEON. This is instituted through a rigorous planning process that details, for each year of the anticipated project duration, the project's budget and schedule. These schedules and budgets with estimated out-year costs are thoroughly reviewed through a series of NSF managed panels. Authorization to commence construction by the National Science Board, the NSF Director, OMB, and Congress is contingent on the successful outcome of these reviews.

Impacts of Profile Perturbations.—NEON is currently approaching the middle of its approved construction profile that commenced in fiscal year 2011. Perturbations to that profile will impact contracts and agreements to industry for work in progress. This will impact a variety of activities, ranging from the hiring of local skilled labor for the installation of civil infrastructure like electrical power and concrete foundations for NEON's bio-meteorological towers, to the procurement of automated sensors from high-tech industries. Delays in these activities, coupled with the cost of maintaining skilled Observatory staff, will ultimately increase the cost of this project. The construction process is subject to NSF's "no cost-overruns" policy. If funding falls below what is needed to build this observatory, it will result in a facility that will fall short of its scientific promise.

Guided by environmental grand challenges proposed by the National Research Council (NRC), NEON scientists and engineers partnered with the scientific community to define the capabilities required of the Observatory to enable transformational science. These capabilities were reviewed and approved by NSF panels, and consequently a construction profile crafted to deliver those capabilities. NEON must be built to those specifications if the scientific community is to successfully address the NRC grand challenges. Only then can we begin to understand the impacts of large-scale environmental changes on our ability to sustainably meet society's food, fiber, energy, and water needs. Only then will the United States have the unique distinction of possessing the only large-scale scientific infrastructure capable of listening to the pulse of an entire continent's ecosystem.

Conclusion.—NEON is not only an essential investment for continued U.S. scientific leadership, but it also helps fuel the Nation's long-term competitiveness and innovation agenda. I recognize the severe budget constraints facing Congress. Funding such projects as closely as technically feasible to the levels proposed in their funding profiles will ensure the efficient use of taxpayer dollars, while delivering essential capabilities to the scientific community to enable transformational science.

Thank you for the opportunity to appear before you today. I would be happy to answer any questions you might have.

PREPARED STATEMENT OF THE NATIONAL ESTUARINE RESEARCH RESERVE
ASSOCIATION

The National Estuarine Research Reserve Association (NERRA) is a not-for-profit scientific and educational organization dedicated to the protection, understanding, and science-based management of our nation's estuaries and coasts. Our members are the 28 reserves that make up the National Estuarine Research Reserve System (NERRS). Established in 1987, NERRA facilitates its members' mission to protect our nation's estuaries and to promote conservation-based research, education, and stewardship through the reserves. For fiscal year 2014, NERRA strongly recommends the following reserve system programs and funding levels within the National Oceanic and Atmospheric Administration (NOAA):

—NERRS Operations—\$22.3 million.

—NERRS Procurement, Acquisition, and Construction (PAC)—\$1.69 million.

Additionally, NERRA also requests appropriation language directing NOAA to ensure that every reserve will get no less than the fiscal year 2012 allocation. This will enable all reserves to meet obligations for core operations associated with research, education, stewardship, and coastal training responsibilities.

NERRS are 28 protected estuaries—home to our most productive habitats and populated communities—that support effective coastal resource management, research, and education to meet the national interest as mandated by Congress in the Coastal Zone Management Act (CZMA) of 1972. The States have been entrusted to operate and manage NOAA's program in 22 States and Puerto Rico where over 1.3 million acres of land and water are protected in perpetuity. What sets this program apart from other place-based Federal programs, like the National Marine Sanctuaries or National Wildlife Refuges for example, is that the reserves manage a Federal partnership program, implemented locally by States or universities.

NERRS assists our coastal communities, industries and resource managers to enhance coastal resiliency in a changing environment. Through science-based management of these protected areas, NERRS provides numerous benefits to communities such as improved water quality, increased flood control, and buffers from storms. NERRS is a leader in coastal monitoring that provides immediate and long-term data to understand harmful algal blooms, assess water quality, identify habitat impacts from changing sea levels, aid in weather forecasting, and improve response to storm surges and inundation.

The reserves have a tremendous positive impact on our economy including work to maintain clean water, keep the seafood and fishing industry viable, and provide communities with practical help and science-based information to address coastal hazards and maintain tourism. Estuaries, where rivers meet the sea, provide nursery ground for ⅔ of commercial fish and shellfish: in NERRS States, the shellfish (wholesale market value) and seafood industry (total sales generated by the seafood industry) contributed over \$2.7 billion to the economy in 2010 (Source: National Ocean Economic Program and NOAA Fisheries, Office of Science and Technology). Protection of these important estuaries within the NERRS can have a significant impact on specific species. For example, the Apalachicola Reserve in Florida is one of three reserves in the State: approximately 90 percent of Florida's oyster harvest

and 10 percent of U.S. total harvest comes from Apalachicola Bay (Source: Wilber, 92).

The work at each reserve goes beyond its property boundaries and creates a number of environmental and economic benefits for the communities and regions where they exist. For example, in 2010, NERRS coastal counties provided 4.4 percent of total wages earned in the U.S. and 4.2 percent of the nation's jobs: contributing over \$26 billion in economic output (measured in gross State product) and supporting more than 468,000 jobs in ocean-dependent industries (Source: Bureau of Labor Statistics; NOAA).

ABOUT THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

Since 1974, beginning with the designation of the South Slough National Estuarine Research Reserve in Oregon, the coastal States and the Federal Government have collaborated to create a unique network of estuarine areas protected for long-term research and education. The NERRS added its 28th reserve on Lake Superior, Wisconsin in October 2010. Currently, NOAA is working with Hawaii to designate its 29th reserve.

Pursuant to the CZMA, each reserve is chosen because it is a representative estuarine ecosystem able to contribute to the biogeographical and typological balance of the NERRS and because the area within the reserve is protected in perpetuity and is available for suitable public purposes such as education and interpretive use. The reserves are a network of protected areas established for long-term research, education, training, and stewardship.

The NERRS's priorities are developed through a collaborative approach between the States and NOAA to address both national and local concerns. The reserves have a mandate pursuant to Section 315 of the CZMA to support the coastal States through research and education as the States address today's most pressing coastal issues such as impacts from changes in sea and lake levels and increased nutrient loading. The reserves conduct research, monitoring, restoration, education, and training designed to improve our understanding and management of coasts and estuaries. The reserves are public places that have significant local, regional, and national benefits because the lands are publicly owned and function as living laboratories and classrooms that are used by scientists, decision makers, educators, and people of all ages. They are located in pristine coastal areas that serve as "sentinel sites," places where early indicators of environmental change are scientifically measured to provide up-to-date information to local officials and the public to support environmental decisionmaking, and inform assessment of trends at the regional and national levels.

NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM OPERATIONS

NERRA requests that program operations be funded at a level of \$22.3 million, an amount level with the Congressional Appropriations Act fiscal year 2012 level. This funding will be shared by the 28 programs to enable the NERRS to manage and maintain healthy estuaries. Healthy estuaries support fishing, seafood, ecotourism, recreation, clean water, and communities. Beyond the economic impact to our national, State, and local economies, reserves have national infrastructure that support bringing science to the management of our coasts and helping our communities prepare for weather-related disasters. In the aftermath of Superstorm Sandy, the Jacques Cousteau Reserve in New Jersey is cited by CNN as being "a natural sponge . . . for absorbing storm and tidal surges." (November 3, 2012). NERRS supports local government and community planning initiatives by providing training to local officials and residents about critical resource management issues such as impending hazards, storm water control, shoreline management, and habitat restoration. These local planning initiatives are designed to help people on the ground and to get resources in the hands of the community—all of which amount to a greater than \$13.4 million offset annually. This was also recently evidenced in the Deepwater Horizon Oil Spill of 2010, a coastal area that is home to five reserves. We know that the billion dollar tourism and seafood industries depend on clean water, and during the Deepwater Horizon Oil Spill crisis the communities and industries along the Gulf Coast relied on disaster support efforts including data supplied by some of the five Gulf Coast National Estuarine Research Reserves, some of which continue today.

Each reserve receives operation funds from NOAA that are matched by the States and are used to leverage significantly more private and local investments that results in each reserve having on average more than five program partners assisting to implement this national program. In addition, the program significantly benefits from volunteers that are engaged in habitat restoration, education and science

which offset operation costs at reserves by donating thousands of hours. Between fiscal year 2006 and fiscal year 2010, volunteers have contributed more than 460,400 hours to the NERRS. In fiscal year 2010 volunteers contributed more than 100,000 hours to the NERRS (Source: NOAA).

NERRS have made countless economic contributions to their local communities, States, and the nation. In the category of eco-tourism, more than 2 million people annually visit the NERRS: an estimated more than \$20 million is generated annually in direct benefit from these visitor use opportunities (estimated using Federal, State, and local park entry fees). Visitors to our reserves walk the trails, paddle the waterways, bird watch, snowshoe, and participate in activities and events at each of our 28 reserves.

In 2011, NERRS contributed more than \$10 million to science and research. One example of this is NERRS water and weather monitoring programs are used at the local, State, and national levels to support assessment of water quality and guide and track remediation strategies, aid in weather and marine forecasts, support emergency response, and aid the water dependent and insurance industries. NERRS land conservation ensures that 1.3 million acres of coastal property worth more than \$6.5 billion are protected. (Estimated based on the average cost of Federal investment per acre of land added to reserves over the last 10 years.)

In addition, NERRS strategically contributes more than \$4.9 million annually in education relief offsets to communities that face tight budgets in meeting the needs of local school districts, educating over 83,000 children annually through school based programs grades K-12. This is a major benefit in some communities where local school districts have been forced to cut programs in these economic times. Through its Estuaries 101 curriculum, reserves prepare the next generation workforce in the key disciplines of science, technology, engineering and math (STEM education).

NERRS PROCUREMENT, ACQUISITION, AND CONSTRUCTION (PAC)

NERRA requests \$1.69 million for land conservation and facilities to maintain, upgrade, and construct reserve facilities and acquire priority lands. This competitive funding program is matched by State funds and has resulted in not only the preservation of critical coastal lands as described above, but also in the increase of construction jobs. For example NERRS creates more than 60 jobs for each \$1 million of Federal construction (PAC) money spent. In addition, NERRS leveraged investments of more than \$114 million to purchase 30,000+ acres of coastal property over the last 10 years. A recent assessment of construction and acquisition priorities at the reserves shows that the NERRS have needs for more than \$60 million for fiscal years 2011 through 2015.

SUPPORT REQUESTED FOR COAST AND OCEAN AND MANAGEMENT

NERRS are connected to the coast and ocean management work done by its State and Federal partners. Specifically, in the States, reserves primary partners are the State coastal management programs in the majority of the States. NERRA requests Subcommittee support for Coastal Zone Management (CZM) grants at \$67 million. In addition, many reserves rely on congressionally appropriated Bay Watershed Estuary Training (B-Wet) funds to augment educational funds. Therefore, NERRA request your support for this program in the appropriation for B-Wet grants. Finally, the reserves depend on NOAA's technical assistance and partnership capacity. NERRA requests support of \$29.2 million for the Coastal Services Center and \$8 million for CZM Stewardship.

CONCLUSION

NERRA greatly appreciates the support the Subcommittee has provided in the past. This support has been critical to sustain and increase the economic viability of the coast and estuary-based industries. We urge you to give every consideration to these requests as you move forward in the fiscal year 2014 appropriations process. If we can provide any additional information, please contact Executive Director Rebecca K. Roth or NERRA President David Ruple, manager of the Grand Bay National Estuarine Research Reserve.

PREPARED STATEMENT OF THE NORTHWEST INDIAN FISHERIES COMMISSION

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to provide written testimony on the fiscal year 2014 Commerce, Justice, Science and Related Agencies appropriations. My name is Billy Frank, Jr. and I am the Chair-

man of the Northwest Indian Fisheries Commission (NWIFC). The NWIFC is comprised of the 20 tribes that are party to the United States v. Washington¹ (U.S. v. Washington). I submit the following requests for the National Oceanic and Atmospheric Administration/National Marine Fisheries Service and National Ocean Service and identify four specific funding requests.

SUMMARY OF FISCAL YEAR 2014 APPROPRIATIONS REQUEST

National Oceanic and Atmospheric Administration:

- Provide \$110.0 million for the Pacific Coastal Salmon Recovery Fund.
- Provide \$7.859 million for the Pacific Salmon Treaty and the additional \$3.0 million for the 2008 Chinook Salmon Agreement.
- Provide \$15.9 million for the Mitchell Act Hatchery Program.
- Provide \$20.0 million for the Regional Ocean Partnership Grants Program.

TREATY RIGHTS AT RISK AND THE FEDERAL TRUST OBLIGATION

Last year we brought to your attention an initiative that we have been pursuing—our Treaty Rights at Risk (TRAR) initiative. The treaty rights of the western Washington treaty tribes are in imminent danger. Salmon are critical to the tribal cultures, traditions and their economies. The treaty-reserved right to harvest salmon continues to decline due to ongoing loss of habitat. All of this is due to the inability to restore salmon habitat faster than it is being destroyed. Wild salmon and their habitat continue to decline despite massive reductions in harvest and a significant investment in habitat restoration.

The Federal Government has a fiduciary responsibility and an obligation to protect these treaty-reserved natural resources. This obligation is met through policy and funding support that is provided to tribes to allow them to perform the necessary management responsibilities to protect these resources. Without this continued support the treaties will have no meaning as these natural resources disappear. The tribes' treaties are constitutionally-protected and have been confirmed by the Federal courts, including the U.S. Supreme Court. As a signer to these treaties, the Federal Government has an ongoing, non-discretionary obligation to provide adequate funding to the tribes to allow them to protect and preserve these treaty rights.

On behalf of our 20 member tribes, I am providing our fiscal year 2014 natural resources management funding requests for the National Oceanic and Atmospheric Administration (NOAA). Of particular interest to us is the Pacific Coastal Salmon Recovery Fund. This is a critical funding source to restoring salmon habitat and assists tribes in the implementation of salmon recovery plans. It also moves us in the direction of achieving the recovery goals, which is a direct request in our TRAR initiative. We are pleased that the fiscal year 2014 President's budget continues to be supportive of the northwest natural resources funding requests. In addition to our specific requests described below, we also support the budget priorities and funding requests of the National Congress of American Indians.

JUSTIFICATION OF REQUESTS

Provide \$110.0 million for the Pacific Coastal Salmon Recovery Fund.—The Pacific Coastal Salmon Recovery Fund (PCSRF) is a multi-State, multi-tribe program established by Congress in fiscal year 2000 with a primary goal to help recover wild salmon throughout the Pacific Northwest and Alaska. The PCSRF supports projects that restore, conserve and protect Pacific salmon and steelhead and their habitats. PCSRF is making a significant contribution to the recovery of wild salmon throughout the region by financially supporting and leveraging local and regional efforts.

The tribes' overall goal in the PCSRF program is to restore wild salmon populations. The key tribal objective is to protect and restore important habitat that promotes the recovery of ESA listed species and other salmon populations in Puget Sound and along the Washington coast that are essential for western Washington tribes to exercise their treaty-reserved fishing rights consistent with U.S. v. Washington and Hoh v. Baldrige.² These funds support policy and technical capacities within tribes to plan, implement, and monitor recovery activities.

It is for these reasons that the tribes strongly support the PCSRF. The tribes have used these funds to support the scientific salmon recovery approach that makes this program so unique and important. Related to this scientific approach

¹ United States v. Washington, Boldt Decision (1974) reaffirmed Western Washington Tribes' treaty fishing rights.

² Hoh v. Baldrige—A Federal court ruling that required fisheries management on a river-by-river basis.

has been the tribal leadership effort which has developed and is currently implementing the ESA-listed Puget Sound Chinook Recovery Plan approved by NOAA.

We respectfully request \$110.0 million for the PCSRF. These funds have decreased over the past decade from the peak of fiscal year 2002 of \$110.0 million. We continue to support the original intent of Congress that would enable the Federal Government to fulfill its obligations to salmon recovery and the treaty fishing rights of the tribes. Salmon restoration projects not only benefit fish populations and their habitat but provide much needed jobs for the local communities. This would continue to cover watershed restoration and salmon recovery work as well as fish hatchery reform efforts.

Provide \$7.859 million in funding for the Pacific Salmon Treaty and the additional \$3.0 million associated with the 2008 Chinook Salmon Agreement.—In 1985 the Pacific Salmon Treaty (PST) was created through the cooperative efforts of tribal, State, U.S. and Canadian governments, and sport and commercial fishing interests. The Pacific Salmon Commission (PSC) was created by the United States and Canada to implement the treaty. As co-managers of the fishery resources in western Washington, tribal participation in implementing the PST is critical to achieve the goals of the treaty to protect, share and restore salmon resources.

Adult salmon returning to most western Washington streams migrate through U.S. and Canadian waters and are harvested by fisherman from both countries. For years, there were no restrictions on the interception of returning salmon by fishermen of neighboring countries. The 2008 update of the treaty gave additional protection to weak runs of Chinook salmon returning to Puget Sound rivers. The update provided compensation to Alaskan fishermen for lost fishing opportunities, while also funding habitat restoration in the Puget Sound region.

We support the Pacific Salmon Commission/U.S. Section's request of \$7.859 million for the PST. We also support their request of \$1.5 million for the Puget Sound Critical Chinook Stock Program and \$1.5 million for the Coded-Wire-Tagging (CWT) Improvement Program as required by the 2008 PST Chinook Annex Agreement. This funding covers the operation and maintenance costs for the hatchery augmentation programs. These programs were initiated in connection with the 2008 Chinook Agreement of the U.S./Canada Pacific Salmon Treaty as the conservation needs of these populations could not be met by harvest restriction actions alone. The funding also allows for continued maintenance and improvement of the coast-wide CWT program. This is essential for the sustainability and management of our fisheries resources.

Provide \$15.9 million in funding for the Mitchell Act Hatchery Program.—Salmon produced by the Mitchell Act hatcheries on the lower Columbia River are critically important in that they provide significant fish production for harvest opportunities for tribal treaty fisheries in the Columbia River, and for ocean and in-river recreational and commercial fisheries, including tribal treaty fisheries along the Washington coast. This hatchery production is intended to mitigate for the lost production caused by the hydropower dam system on the Columbia River. Overall hatchery production has been reduced from more than 100 million to fewer than 60 million fish.

We respectfully request \$15.9 million for the Mitchell Act Hatchery Program. Funding is provided for the operation of 17 fish hatcheries with the release of between 50 million and 60 million juvenile salmon and steelhead in Oregon, Washington, and Idaho. Providing adequate funding to maintain the current production levels from the Mitchell Act hatcheries on the Columbia River is important as this production supports coastal salmon fisheries and dampens the impact of Canadian fisheries under the terms of the PST Chinook Annex on Puget Sound and coastal stocks. Adequate funding will also allow these facilities to be retrofitted to meet current ESA standards as identified through the hatchery reform process.

Provide \$20.0 million for the Regional Ocean Partnership Grants Program.—The Hoh Tribe, Makah Tribe, Quileute Tribe, and the Quinault Indian Nation have deep connections to the marine resources off the Washington coast. They have pioneered cooperative partnerships with the State of Washington and the Federal Government in an effort to advance management practices in the coastal waters. The four tribes, the State of Washington and NOAA's National Ocean Service, through the Marine Sanctuary Program, formed the Intergovernmental Policy Council (IPC), which is intended to strengthen management partnerships through coordination and focus of work efforts. Through this partnership, the entities hope to maximize resource protection and management, while respecting existing jurisdictional and management authorities.

We respectfully request \$20.0 million for the Regional Ocean Partnership (ROP) Grants Program, within the National Ocean Service Coastal Management account. This would be an ideal program to support tribal participation in this regional ocean

planning body. Funding for this competitive grant program supports regional ocean partnerships, including coastal and marine spatial planning.

The four coastal tribes and the State also wish to engage in an ocean monitoring and research initiative to support and transition into an ecosystem-based fisheries management plan for the Washington coast. This tribal-State effort would be in collaboration with NOAA and consistent with regional priorities identified by a regional planning body. For the tribes and State to conduct an ocean monitoring and research initiative off the Washington coast, they will need funding to support this effort. Regional ocean governance mechanisms facilitate the effective management of ocean and coastal resources across jurisdictional boundaries by improving communications, aligning priorities, and enhancing resource sharing between State, local, tribal and Federal agencies. Healthy oceans are essential if we value stable climates that will sustain our economies and our lives. Tribes must be partners in the efforts to research, clean up and restore the environment in order to deal with identified problems.

CONCLUSION

The treaties and the treaty-reserved right to harvest are the supreme law of the land under the U.S. Constitution. Some of the treaty tribes have had to give up even their most basic ceremonial and subsistence fisheries. Tribes are key partners in the management of natural resources by virtue of treaty-reserved rights and our legal status as co-managers. We have all made a huge investment in the recovery of salmon and their habitat but it has not been enough.

We are sensitive to the budget challenges that Congress faces. However, we urge you to continue to support our efforts and funding requests. Thank you.

PREPARED STATEMENT OF THE NATIONAL MARINE SANCTUARY FOUNDATION

For 13 years, the National Marine Sanctuary Foundation (NMSF) has worked with Congress, the National Oceanic and Atmospheric Administration (NOAA), and a national network of local, non-profit organizations to connect our fellow citizens to the underwater places that define the American ocean—the National Marine Sanctuary System.

We very much appreciate the Subcommittee's strong and continuing effort to provide adequate funding for NOAA's Office of National Marine Sanctuaries (ONMS). In particular, the Committee's fiscal year 2013 restoration of sanctuary funds—and the report language recognizing the impact of sanctuary funding cuts—sent a powerful and necessary message about the economic growth and job creation benefits of the National Marine Sanctuary System, and it also underscored the continuing educational and ecological value of America's underwater treasures.

In recognition of the ongoing coastal job creation benefits provided by national marine sanctuaries—especially through PAC funding—and ONMS' additional responsibilities in fiscal year 2014, NMSF respectfully requests that in fiscal year 2014 the Committee consider appropriating:

- \$5.5 million to the Marine Sanctuaries Construction Base, within NOAA's Procurement, Acquisition, and Construction (PAC) account; and
- \$55 million to Sanctuaries and Marine Protected Areas, within NOAA's Operations, Research, and Facilities (ORF) account.¹

Joining NMSF in this request are nine community-based organizations that support specific sites within the sanctuary system. On behalf of their members from coast to coast, the Channel Islands Sanctuary Foundation (CA), Cordell Marine Sanctuary Foundation (CA), Farallones Marine Sanctuary Association (CA), Friends of Thunder Bay National Marine Sanctuary (MI), Hawai'i National Marine Sanctuary Foundation (HI), Monterey Bay Sanctuary Foundation (CA), Olympic Coast Alliance (WA), Sanctuary Friends Foundation of the Florida Keys (FL), and Stellwagen Alive! (MA) support funding the National Marine Sanctuary System at these levels.

SIGNIFICANT CHANGES TO ONMS RESPONSIBILITIES IN FISCAL YEAR 2014

While we recognize the challenges associated with providing increased funding in the current budget climate, ongoing changes within NOAA have worsened the existing shortfall in sanctuary budgets. A slight increase in ORF funding is warranted in fiscal year 2014 to accommodate the following new priorities.

¹ Previously Marine Sanctuary Program Base.

Marine Protected Areas Center.—Despite the realization of management efficiencies that are actively lowering costs, the proposed fiscal year 2013 consolidation of NOAA's Marine Protected Areas Center (MPAC) with ONMS was accompanied by funding cuts that sharply reduced capacity. We strongly encourage the Committee to consider the complementary nature of activities performed by MPAC and ONMS, and we urge you to ensure that any fiscal year 2014 funding intended for MPAC is added to the Marine Sanctuary Program base level. Furthermore, given the fiscal year 2013 consolidation, it is critical that MPAC funds are appropriated to ONMS rather than NOAA's Coastal Management Program (as was the case in prior years).

National Marine Sanctuary of American Samoa.—Following an extensive public process, in November 2012 the Fagatele Bay National Marine Sanctuary expanded from 0.25 to 13,581 square miles, incorporating the Rose Atoll Marine National Monument. We strongly encourage the Committee to ensure that fiscal year 2014 funding intended for Rose Atoll management is added to the Marine Sanctuary Program base level. Furthermore, given the incorporation of Rose Atoll into the renamed National Marine Sanctuary of American Samoa, it is critical that Rose Atoll funds are appropriated to ONMS rather than NOAA's National Marine Fisheries Service (as was the case in prior years).

Site Evaluation List Reactivation Under the National Ocean Policy.—The National Ocean Policy Implementation Plan directs NOAA to reactivate and repopulate the sanctuary Site Evaluation List (SEL) with marine areas that have been identified as nationally significant, and we strongly encourage the Committee to ensure that any fiscal year 2014 funding intended for new site evaluation is added to the Marine Sanctuary Program base level. No new marine areas have been considered for sanctuary designation since at least 1995, and sufficient resources will allow ONMS to engage in a transparent and public process that can inform and complement NOAA's report on plans to expand marine sanctuaries, per the Committee's direction in fiscal year 2013.

NATIONAL MARINE SANCTUARIES ARE UNIQUE AND SUCCESSFUL OCEAN CONSERVATION TOOLS

Sanctuaries embody our nation's commitment to preserve the best of the American ocean for future generations—they are our underwater national parks. They support economic vitality and thousands of businesses in coastal communities, preserve vibrant underwater and maritime treasures for our children and grandchildren to enjoy, and provide critical public access for ocean recreation, research, and education. Through stakeholder-driven planning processes designed to accommodate multiple uses of the ocean and validated repeatedly over the 40-year history of the sanctuary program, ONMS successfully manages 13 national marine sanctuaries and the Papahānaumokuākea Marine National Monument.

Numerous external reviews have concluded that sanctuaries are fundamentally well-conceived, cover gaps in other Federal laws, and are making progress towards long-term protection of marine ecosystems. Unlike most other ocean resource laws, which focus on controlling specific activities or managing specific species, the National Marine Sanctuaries Act protects nationally significant places, along with the natural, historical, and cultural riches that make them worth preserving for future generations. Experience shows that this approach is vital to maintaining the healthy seascapes that underpin our incredibly productive coastal economies—and that the return on our investment in sanctuaries is simply too valuable to ignore.

NATIONAL MARINE SANCTUARIES ARE ECONOMIC ENGINES FOR COASTAL COMMUNITIES

Between 2005 and 2009, when overall U.S. employment dropped by 2.3 percent, coastal tourism and recreation employment grew by 2.7 percent and helped our nation survive the recession.

Sanctuary stewardship efforts are vital to the success of coastal businesses. According to the National Ocean Economics Program, 72 percent of ocean and coastal employment—over 1.8 million jobs in 2009—in the tourism and recreation sector depends on visitor opportunities that require the clean beaches, clean water, and abundant fish and wildlife promoted by the National Marine Sanctuary System. Investing in sanctuaries does much more than simply protect small areas of the ocean—national marine sanctuaries are fueling job creation in coastal communities, and investing in sanctuaries is a down payment on the future of equipment manufacturers, hospitality operators, and ocean recreation vendors, not to mention the many other Americans whose livelihoods are dependent on a healthy ocean and coasts. We offer the following examples to suggest that the benefits of funding our national marine sanctuaries far outweigh the Federal outlays that support them:

- Management of the Stellwagen Bank National Marine Sanctuary off Massachusetts costs taxpayers under \$2 million annually, and healthy sanctuary waters draw the tourists who spent \$126 million on commercial whale-watching trips there during 2008 alone, supporting 31 businesses and almost 600 jobs.
- Taxpayers spend less than \$3 million per year to manage the Monterey Bay National Marine Sanctuary off California, whose waters are the focus of a marine science and education industry that employed over 2,100 people and had a \$291 million budget in 2012.
- The Florida Keys National Marine Sanctuary, where management costs less than \$6 million per year, protects coral reefs and legal fishing opportunities that are the backbone of a marine tourism and recreation industry in the two adjacent counties—employing over 70,000 people and contributing \$4.5 billion per year to State GDP.

NATIONAL MARINE SANCTUARIES START AND STAY IN LOCAL COMMUNITIES

The designation and management of new sanctuaries are wholly dependent on “bottom-up” processes where local communities are involved from the very beginning—sanctuaries actually devolve power from Washington, DC and give constituents control over the destiny of their coasts. All sanctuary rules and regulations are developed on a site-by-site basis, and sanctuaries are designed from the outset to accommodate multiple uses of the ocean. Coastal communities have a controlling influence on sanctuary priorities, ensuring that they address unique, local circumstances. This community-driven approach to decide where sanctuaries are located and what is allowed within them is one of the most public in our democracy—and it’s only one reason why 98 percent of sanctuaries remain open to fishing.

National marine sanctuaries are created by and for the people; citizens and communities propose sites and then have at least three additional chances to weigh in during the process. In addition, over 700 Sanctuary Advisory Council representatives from the fishing, tourism, and maritime commerce industries; Tribes, State and local government; and researchers, educators, and conservationists spend over 13,000 hours each year to help manage sanctuary operations day-to-day. Sanctuaries are also hubs for volunteer activity: over 100,000 hours are contributed by local sanctuary volunteers each year, and sanctuary volunteer programs in California and Hawai‘i have won the Federal Government’s Take Pride in America Award (for Outstanding Federal Volunteer Program) for the past 2 years.

NATIONAL MARINE SANCTUARIES’ PROGRAMMATIC OUTLOOK UNDER REDUCED FISCAL YEAR 2014 FUNDING LEVELS

Sequestration alone will likely result in the termination of 15 contractors, and six FTE-equivalent positions will remain unfilled (this combination is equivalent to a 5 percent workforce reduction). In addition, a decrease of \$500,000 in funding for vessel operations and maintenance will most likely result in cancelled cruises and degraded equipment.

We project that additional budget cuts will result in more terminations of contractors who perform FTE-equivalent duties; reduced operations at visitor centers; a lack of contingency funding needed in case of emergencies like oil spills; and additional inoperable vessels tied up at the docks. In addition, lack of funds will likely result in cuts to public access and recreation opportunities, cancellation of partnerships that leverage private funds for taxpayer benefits, and the dismantling of successful education initiatives.

The potential impact of reducing sanctuary appropriations goes far beyond the individual sanctuaries themselves: limiting visitor center hours, eliminating research programs, and diminishing enforcement capacities will prevent ONMS from fulfilling its statutory mandates while also reducing the economic activity and job creation that surround healthy sanctuary communities from coast to coast. For example, funding national marine sanctuaries below the recommended levels could force the program to:

- Cut treasured public access and recreation opportunities for all Americans. Funding cuts risk the Florida Keys National Marine Sanctuary’s 767 mooring buoys, which provide public access and recreational opportunities within the sanctuary while protecting coral reefs and shipwrecks from anchor damage, preserving them for future generations.
- Restrict enforcement operations that protect legal fishermen. Lack of funding jeopardizes on-water patrols for illegal fishermen in the Florida Keys National Marine Sanctuary. In a single 2013 case, illegal fishermen were charged with over 1,300 violations for pilfering 664 yellowtail snapper from a closed area that

was recently shown to have provided benefits to both fish populations and commercial and recreational anglers.

- Dramatically shrink visitor center hours. Sanctuary visitor centers serve as the public face of NOAA and see over 350,000 visitors per year, including the Monterey Bay National Marine Sanctuary Exploration Center (Santa Cruz, CA), Mokupāpapa Discovery Center (Hilo, HI), Great Lakes Maritime Heritage Center (Alpena, MI), and Florida Keys EcoDiscovery Center (Key West, FL).
- Eliminate collaborations with museums that leverage private funds for taxpayer benefits. Placing educational exhibits in partner institutions, like the California Academy of Sciences' three-story "California Coast" aquarium, is a successful and cost-effective method for reaching the American public. Over 1 million Academy visitors each year learn how the Gulf of the Farallones National Marine Sanctuary protects America's valuable ocean and maritime resources.
- Cancel partnerships with universities that leverage private funds for taxpayer benefits. Funding cuts could risk research alliances with Oregon State University, Stanford University, and the University of California for collection of wind, tide, current, and marine life data critical to maritime commerce and search-and-rescue operations within the Channel Islands, Monterey Bay, Gulf of the Farallones, Cordell Bank, and Olympic Coast National Marine Sanctuaries.

NOAA NEEDS SUFFICIENT FUNDS TO FULFILL ITS RESPONSIBILITIES TO THE AMERICAN PEOPLE

From weather forecasts to fisheries management, NOAA provides decision makers with critically important data, products, and services that promote and enhance the nation's economy, security, environment, and quality of life. As a member of the Friends of NOAA coalition, NMSF strongly encourages the Committee to support funding NOAA at or above the President's Request of \$5.4 billion for fiscal year 2014 to avoid endangering lives and livelihoods that depend on NOAA services.

PREPARED STATEMENT OF THE NATURAL SCIENCE COLLECTIONS ALLIANCE

The Natural Science Collections Alliance appreciates the opportunity to provide testimony in support of fiscal year 2014 appropriations for the National Science Foundation. We encourage Congress to provide the National Science Foundation (NSF) with at least \$7.626 billion in fiscal year 2014.

The Natural Science Collections Alliance is a non-profit association that supports natural science collections, their human resources, the institutions that house them, and their research activities for the benefit of science and society. Our membership consists of institutions which are part of an international community of museums, botanical gardens, herbaria, universities, and other institutions that contain natural science collections and use them in research, exhibitions, academic and informal science education, and outreach activities.

THE ROLE OF NSF IN SCIENTIFIC EXCELLENCE

Federal support for science is an investment in our nation's future. The NSF supports research that creates new knowledge and helps to drive innovation and economic growth. NSF-supported research has led to improvements in human health, food and national security, energy, and natural resource management.

NSF also trains the next generation of researchers and science educators. The agency supports graduate student research training programs that help maintain our nation's global competitiveness. Moreover, K-12 education initiatives ensure a pipeline of scientifically skilled workers for tomorrow's jobs.

America's continued excellence in science and technology depends on sustained investments in research and science education. The progress of basic scientific research requires a steady Federal investment. Unpredictable swings in Federal funding can disrupt research programs, create uncertainty in the research community, and impede the development of solutions to the nation's most pressing problems.

BIOLOGICAL RESEARCH AT NSF

NSF's Biological Sciences Directorate (BIO) is the primary Federal funding source for fundamental biological research. BIO serves a vital role in ensuring our nation's continued leadership in the biological sciences by providing about 64 percent of Federal grant support for basic biological research conducted at our nation's universities and other nonprofit research centers, including natural history museums.

BIO's support of transformative research has advanced our understanding of complex living systems and is leading the way forward in addressing major challenges,

such as understanding how biological species diversity helps to regulate environmental systems, identifying novel and cost-effective methods for combating invasive species, and developing new bio-inspired technologies.

Equally important, BIO provides essential support for our nation's biological research infrastructure, such as natural science collections and natural history museums. These research centers enable scientists to study the basic data of life, conduct modern biological and environmental research, and provide undergraduate and graduate students with hands-on training opportunities.

SUPPORT FOR SCIENTIFIC COLLECTIONS

Scientific collections play a central role in many fields of biological research, including disease ecology and biodiversity science. Our member institutions also provide critical information about existing gaps in our knowledge of life on Earth. Indeed, the Federal Interagency Working Group on Scientific Collections recognized this value in their 2009 report, which found that "scientific collections are essential to supporting agency missions and are thus vital to supporting the global research enterprise."

We strongly encourage Congress to sustain NSF's support for the digitization of high priority U.S. specimen collections. NSF's investment in digitization will enable the scientific community to ensure access to and appropriate curation of irreplaceable biological specimens and associated data, and will stimulate the development of new computer hardware and software, digitization technologies, and database management tools. This effort is bringing together biologists, computer science specialists, and engineers in multi-disciplinary teams to develop innovative imaging, robotics, and data storage and retrieval methods. These tools will expedite the digitization of collections and contribute to the development of new products or services of value to other industries.

NSF has supported efforts by the biological collections community to make bio-collections and their associated data more accessible. A series of workshops of bio-collection experts has resulted in a community-wide initiative to develop a Network Integrated Biocollections Alliance (NIBA). The NIBA is envisioned as a coordinated, large-scale effort to digitize the nation's biological collections. Federal support is necessary if this goal is to be achieved. For example, the effort will require new initiatives that will support advanced engineering of biocollections cyberinfrastructure, enhanced training for collections staff, and infusing specimen-based learning into education, among other recommendations.

The fiscal year 2014 request would also create a new program to link long-term planetary biodiversity data with specimen and collections data. This integration of data will enable novel interdisciplinary research in biodiversity science.

OTHER NSF PROGRAMS

The Dimensions of Biodiversity program supports cross-disciplinary research to describe and understand the scope and role of life on Earth. Despite centuries of discovery, most of our planet's biological species diversity remains unknown. This lack of knowledge is particularly troubling given the rapid and permanent loss of global biological diversity. Better understanding of life on Earth will help us protect valuable ecosystem services and make new bio-based discoveries in the realms of food, fiber, fuel, pharmaceuticals, and bio-inspired innovation.

The Directorate for Geosciences (GEO) also supports research and student training opportunities in natural history collections. GEO supports cross-disciplinary research on the interactions between Earth's living and non-living systems—research that has important implications for our understanding of water and natural resource management, climate change, and biodiversity.

Within the Directorate for Education and Human Resources, the Advancing Informal STEM Learning program is furthering our understanding of informal science, technology, engineering, and mathematics (STEM) education. This program, formerly called the Informal Science Education program, supports projects that create tools and resources for STEM educators working outside traditional classrooms, such as at museums, botanic gardens, and zoos.

CONCLUSION

Continued investments in the NSF programs that support natural science collections research and education are essential if we are to maintain the United States' global leadership in innovation. Sustained investments in NSF will help spur economic growth and new discoveries and continue to build scientific capacity at a time when our nation is at risk of being outpaced by our global competitors. Please support an investment of at least \$7.626 billion for NSF for fiscal year 2014.

Thank you for your thoughtful consideration of this request and for your prior support of the National Science Foundation.

PREPARED STATEMENT OF THE OCEAN CONSERVANCY

Thank you for this opportunity to provide Ocean Conservancy's recommendations for fiscal year 2014 funding for NOAA. We urge Congress to provide an overall funding level for NOAA that both funds the request for NOAA's satellite procurements and restores overall funding for ocean and coastal programs to fiscal year 2010 levels or above. We recommend the following funding levels for specific programs:

Account, Program or Activity	Fiscal Year 2012 Enacted	Fiscal Year 2014 Recommended Level
Operations, Research and Facilities:		
National Ocean Service:		
Regional Ocean Partnerships	\$3.5	\$10
Marine Debris	4.6	6
National Marine Fisheries Service:		
Expand Annual Stock Assessments	63.5	75
Fisheries Statistics	23.1	24
Office of Oceanic and Atmospheric Research:		
Integrated Ocean Acidification	6.2	11.6
Program Support:		
Office of Marine and Aviation Operations	182.9	210

Ocean Conservancy has worked for nearly 40 years to address ocean threats through sound, practical policies that protect our ocean and improve our lives. We recognize that real leadership means real cooperation—between governments, businesses, scientists, policymakers, conservation organizations, and citizens. Our focus is on creating concrete solutions that lead to lasting change—so we can benefit from the ocean for generations to come.

We simply cannot afford the under-funding of NOAA's ocean and coastal programs. NOAA's mission in protecting, restoring and managing our oceans and coasts is vitally important not only to our oceans and coasts but also to our coastal and national economies. In 2010, according to the National Ocean Economics Program, coastal tourism and recreation contributed more than \$89 billion to the Gross Domestic Product and accounted for over 1.9 million jobs. Just last year, Superstorm Sandy showed how critical NOAA's coastal resilience programs are for protecting lives and property from damaging storms. Covering two-thirds of Earth's surface, the ocean is home to 97 percent of all life. Even the air we breathe is connected to a healthy ocean—more than half of the oxygen in the atmosphere is generated by ocean-dwelling organisms.

While we recognize these are tough fiscal times, and Congress is trimming government budgets across-the-board, NOAA's ocean programs have been particularly hard-hit with a roughly 14 percent reduction since 2010. On top of these cuts, the Government-wide sequester currently in place reduces NOAA's budget by another 5 percent. With satellite procurement costs continuing to grow, we urge Congress to maintain a balanced portfolio on investments across NOAA's missions. Americans shouldn't have to choose between forecasting the weather and protecting our ocean. We need both.

We recommend a total funding for NOAA that provides the resources needed to make smart choices for a healthy ocean that will not just benefit those who live and work along the coast, but the American economy and environment as a whole.

Within the recommended funding of the Operations, Research, and Facilities account, Ocean Conservancy would like to highlight the following as top priorities for robust funding:

INVESTMENTS IN FISHERIES SCIENCE AND INFORMATION

Expand Annual Stock Assessments, \$75 million.—Stock assessments provide critically needed resources for fisheries managers to assess priority fish stocks, implement the requirement for annual catch limits (ACLs), and ensure the successful recovery of overfished populations. The survey and monitoring and stock assessment activities funded under this line give fishery managers greater confidence that their ACLs will avoid overfishing while providing optimal fishing opportunities. Because

the information provided by stock assessments is so vital to the implementation of ACLs and long-term goals for sustainable management of U.S. fisheries, increased funding for stock assessments should remain among the highest priorities in fiscal year 2014 and beyond. In 2012, NOAA turned the corner on ending overfishing and achieved a landmark for Federal fisheries management in the U.S. through the implementation of ACLs for all federally managed fish stocks. In addition, better catch data contribute to more robust stock assessments, increasing the accuracy of fish population size estimates and allowing for better identification of catch targets and thresholds that prevent overfishing.

Fisheries Statistics: Marine Recreational Fisheries Monitoring, \$24 million.—Despite their often sizeable economic and biological impacts, much less data are collected from recreational saltwater fisheries than commercial fisheries due to the sheer number of participants and limited sampling of anglers' catches. The low level of data collection and lack of timely reporting of data in these fisheries are a large source of uncertainty and have become a flashpoint for controversy in regions where catch restrictions have been adopted to rebuild overfished stocks, particularly in the Southeast. By all accounts, improved sampling and timelier reporting of catch data are needed for successful management of marine recreational fisheries.

OMAO Operations and Maintenance, \$210 million.—Base funding for NOAA's Office of Marine and Aviation Operations (OMAO) supports a fleet of 10 Fishery Research Vessels whose primary mission is to provide baseline information on fish populations that is critical to the development and regular updating of fishery stock assessments for the catch-setting process. More than 80 percent of stock assessments for species rely on this data. In recent years, however, rising operating costs (largely attributable to rising fuel costs) and budget constraints have sharply reduced the base-funded days at sea (DAS) for NOAA's fleet. The number of base-funded DAS for NOAA's fleet declined 40 percent between 2006 and 2011 forcing NMFS to spend its program funds to "buy back" days at sea not covered by OMAO in order to maintain its regularly scheduled surveys and collect data that is needed to set appropriate catch limits. Without the independent surveys conducted by these vessels managers must increase the uncertainty when setting catch limits which can decrease fishing opportunities.

REGIONAL OCEAN PARTNERSHIP GRANTS: \$10 MILLION

The Regional Ocean Partnership (ROP) Grants program provides competitively awarded funds to advance regional priorities for ocean and coastal management and science, ensuring that ocean management priorities are set at the State and regional level and determined by actual, on-the-ground needs. Regional approaches continue to be the most effective and efficient way to address ocean management challenges.

Nearly all coastal governors have voluntarily joined together to establish Regional Ocean Partnerships that connect State and Federal agencies, tribes, local governments, and stakeholders to tackle ocean and coastal management issues of common concern, such as siting offshore energy, habitat restoration, coastal storm mitigation and reducing marine debris. While the priorities, structures, and methods of each partnership may differ to suit the needs of each region, they are collectively working toward an improved ocean environment and a stronger ocean and coastal economy. The grant program also helps Regional Ocean Partnerships leverage Federal agencies' scientific research and data collection capacity by linking their activities with Federal programs. Regional Ocean Partnerships are already producing on-the-ground results that benefit both the economy and the environment, including cutting edge scientific research, monitoring and practical tools like maps and surveys.

If these competitive grant funds are reduced or eliminated, States and their partnerships will be weakened—making them less able to assist local and regional ocean and coastal management needs and priorities, or leverage the Federal Government's support, expertise, and data collection capacity. For fiscal year 2014, we request \$10 million, \$6.5 million above the fiscal year 2012 enacted level of \$3.5 million.

MARINE DEBRIS: \$6 MILLION

Marine debris has become one of the pervasive pollution problems facing the world's oceans, coasts and waterways. Research has demonstrated that persistent debris has serious effects on the marine environment, wildlife and the economy. Marine debris causes wildlife entanglement, ghost fishing, destruction of habitat, navigational hazards, and vessel damage and pollutes coastal areas. The problem of marine debris has been growing over the past several decades and natural disasters such as the 2011 Japanese tsunami tragedy and Superstorm Sandy can exacerbate an already challenging issue. Trash travels and tsunami debris is impacting the West Coast now. Boats, a dock and various other forms of debris have washed on-

shore creating removal challenges and concerns over invasive species. On the East Coast, entire piers were washed into the ocean when Superstorm Sandy hit.

While the quantity of marine debris in our ocean has greatly increased, funding for NOAA's Marine Debris Program has remained well below the historically authorized level of \$10 million. Additional resources are needed to ensure NOAA has the capacity to monitor and respond to the impacts of debris from the tsunami, the Superstorm, and other sources. In order to sustain current programs and allow NOAA the capacity to evaluate, track and clean up debris, for fiscal year 2014 we request \$6 million, \$1.5 million above fiscal year 2012 funding levels.

INTEGRATED OCEAN ACIDIFICATION PROGRAM: \$11.6 MILLION

In recent years, scientists have raised the alarm about ocean acidification—a process whereby ocean waters' absorption of carbon dioxide emissions alters marine acidity. Over the last 250 years, oceans have absorbed 530 billion tons of carbon dioxide, triggering a 30 percent increase in ocean acidity. These changes can have far-reaching consequences for marine life, including economically important species like shellfish and corals. For example, the shellfish industry in the Pacific Northwest has been devastated in recent years as more acidic waters encroached upon important oyster hatcheries, nearly wiping out several years-worth of oyster "seed."

Recognizing the dire need for better understanding of this emerging economic threat, in early 2009 Congress passed and enacted the Federal Ocean Acidification Research and Monitoring (FOARAM) Act. Under FOARAM, Congress instructed NOAA to establish an ocean acidification program to coordinate research, establish a monitoring program, develop adaptation strategies, and provide critical research grants to improve the understanding of ocean acidification's ecological and socio-economic impacts. Because economic impacts like those seen in the shellfish industry are on the leading edge of what will be a growing problem, adequate funding for this line item is critical to fulfill Congress's directives and build the scientific foundation needed to protect vulnerable industries from ocean acidification.

We believe that the President's fiscal year 2012 request of \$11.6 million is reflective of the actual on-the-ground needs for Ocean Acidification. As stated in the President's fiscal year 2012 NOAA Congressional Budget Justification, funding at the \$11.6 million level will allow NOAA to develop more cost-efficient acidification sensors for monitoring; conduct an assessment of acidification effects on commercial and recreational marine fish stocks; and create a Coral Reef Ocean Acidification Observing Network. By increasing the programmatic funding for Integrated Ocean Acidification to this level, NOAA will be able to take these concrete actions to more effectively tackle the economic, on-the-ground implications of ocean acidification and prepare more effectively for future adaptation strategies that will protect our nation's key ocean and coastal economic assets.

Thank you for the opportunity to provide this testimony. If you would like further information, please contact Emily Woglor.

PREPARED STATEMENT OF THE QUINAULT INDIAN NATION

\$1.3 Million Appropriations Request—Budget for Quinault Nation Narcotics Enforcement Team (QNNET) Annual Staffing and Operations

(1) Staffing (two field agents, two administrative agents, one administrative assistant): \$670,000.

(2) Operating expenditures: \$630,000.

Honorable Chairman Wolf and members of the Appropriations Subcommittee, I submit the following comments on behalf of the people of the Quinault Indian Nation, a sovereign Treaty Indian Tribe located on the Pacific Ocean in the State of Washington. The Quinault Indian Reservation is a land of beautiful forests, rivers, and lakes and 23 miles of unspoiled Pacific coastline. Our people have flourished in this region for thousands of years, sustained by the magnificent natural resources provided by our Creator. Our culture remains enriched by the principles of our heritage and we are committed to high standards of stewardship and the objectives of sustainable prosperity.

However, there are challenges forced upon us in some measure by the excesses of contemporary non-tribal society, which threatens our existence, as we know it. My testimony shall, in particular, address the drug and weapons trafficking on and through our Reservation.

The commitment level of the Quinault tribal government to eliminating illegal drugs and guns as well as smuggling from our lands is absolute. Our tolerance level is zero and our tribal police and social service agencies work daily, on a cooperative basis with local, State and Federal agencies and community members to deal with

these problems. Yet we are facing escalating threats of drug trafficking, narcotic distribution, related gang activity and weapons offenses, leading to devastating social, health, and environmental consequences. The social fabric of these criminal communities has changed. Elder abuse has expanded as a result of drug trafficking. Our young people are increasingly affected. More than 30 percent of all drug and alcohol arrests are juveniles.

There is an unfortunate belief among smugglers that our open-ocean borders provide easy access for their free movement. We are committed to quashing that belief. We are working day and night, year around, to effect the strongest possible enforcement. We will not allow our lands to be an open door to the flow of poisons into our society. Our objective is to let the message be spread far and wide to those who would harm our people, "Don't mess with Quinault."³ That message will be conveyed, in force, to those who dare to produce or distribute illegal narcotics or guns on our lands. Far too much is at stake for us to take any other position.

We ask for your support in this endeavor.

The Quinault Business Committee, our tribal legislative body, voted to combat these problems by forming the Quinault Nation Narcotics Enforcement Team (QNNET) in 2011. This agency continues to prevent and suppress narcotic trafficking and drug use through intensive investigations and collaboration efforts.

The QNNET apprehension record includes more than 60 drug related arrests that led to successful prosecution by the appropriate agency. Seizures included cocaine, marijuana, heroin, prescription drugs, and methamphetamines. In early 2004, QIN's Tribal Code did not differentiate the punitive measures for those possessing marijuana from those possessing heroin or methamphetamine. At the present time, the legal codes are now rewritten and strengthened.

QNNET has, against all odds, established itself as one of the top Tribal Narcotics units in the Northwest. QNNET, in cooperation with the U.S. Drug Enforcement Agency and State and local drug units has identified Mexican Drug Cartel members on the Quinault Nation Reservation and we have been working to rid ourselves of them. Last year, QNNET along with other agencies arrested members of a Mexican drug ring and seized more than three pounds of Heroin. QNNET assisted in the seizure of more than 19 pounds of Meth just outside the boundaries of the Reservation and provided information that led to the seizure of more than 255 pounds of Meth from a Mexican drug house in Modesto, California.

QNNET continues to receive information regarding planes able to land on our beaches, alongside boats that have been observed by tribal members, which appeared to be used in off loading of drugs. The Quinault Nation has 26 miles of beaches that are not able to be patrolled due to a lack of staffing. That is a situation that must change. QNNET is also active in interdiction on the U.S. 101 Highway, considered by many to be an alternate route to the Canadian border.

QNNET devotes time to addressing local drug issues with the Tribal Villages and providing education in our schools. QNNET has been very successful in removing drug dealers from the streets and to an increasing degree getting drug users into treatment.

QNNET is in need of additional resources and training to address all of these issues. The potential for extreme violence is always present when dealing with Mexican Cartel members and others who choose to use the Quinault Indian Nation as a distribution center for narcotics.

The regional topography renders the Reservation susceptible to drug smuggling and production. The Washington section of the United States-Canadian border is approximately 430 miles in length, a significant portion of which is vast, dense forest. This includes more than 55 miles of rural highways, 18 miles of open coastline, and a border that has 13 official ports of entry, leaving the rest of the border largely unpatrolled.

Let there be no mistake. The Quinault Nation is at war with illegal drug smugglers, and we need the help of the United States Government to solve these problems and win this war.

We continue to work toward resolution of various specific challenges, including: The updating of GPS and coordinate radio capabilities to field agents; provision of adequate broadband access, particularly in remote areas and the heavily forested lands; closed circuit surveillance of forest roads, public highways, and clandestine ports used by narcotic traffickers; interdepartmental cross-training for law enforcement officers; increasing case selection for prosecution; establishing strong cultural programs and traditional practices as a part of prevention standards and post-arrest care for offenders with mental health or chemical dependency issues for implementation by direct services providers; balancing community trust with operational confidentiality; building sustainable, diverse revenue sources; promoting interagency trust and open communication with Federal, military, and law enforcement agen-

cies; developing community rapport without jeopardizing identity or confidentiality; and gaining access to incarceration and interrogation facilities.

CONCLUSION

In supporting our program, you are supporting the health and well-being of tribal citizens as well as the Federal Trust Responsibility to our Tribe. I am very pleased to report to you that there is another very good reason to support the appropriations requests related to our drug, alcohol and weapons program—it's working!

Since October 2010, our officers have expanded positive working relationships with Federal, State and local agencies. Together, we were able to bust a cartel-supported drug ring on the Reservation. We have seized more than 128 kilograms of drugs, more than \$2.7 million in cash, drugs, etc., conducted 123 investigations that led to arrests, added a very valuable K-9 dog and handler to our force, and we have seen a drop in personal property crimes as a result of these and other measures.

However, the influx of Cartel Members within the northern area of our Reservation continues to be a direct threat to the safety and welfare of our tribal members and employees, as well as others. This past year a tribal member was hunting in the northern area forest when she observed a body near a logging road. As QNNET arrived on the scene, the body had been removed and subsequent QNNET investigations did indicate that the dead body was the result of a drug related incident.

As I have pointed out, the Quinault Nation has 26 miles of unprotected shoreline. Due to a lack of staffing and resources, QNNET is unable to actively patrol these areas of concern. A more proactive approach is an absolute necessity to address this issue.

There is an urgent need for QNNET to remain funded. Additional staffing is needed to not only become more proactive in our approach to drug investigation but also for officer safety concerns. Without funding and additional staffing, it will be a challenge to stop the flow of drugs into Indian country and to protect the quality of life that each tribal member is entitled to and deserves.

The Quinault Indian Nation is committed to continuing efforts to reduce the sale, use, and distribution of illegal drugs by investigating, arresting, and prosecuting offenders. With ongoing financial support from key partners, QIN will continue to leverage resources, and continue embracing positive activities and our culture to deter first use among tribal youth. We will continue to link offenders with culturally competent substance abuse treatment. We will also continue to build collaborative relationships with Federal, State, and local agencies to deploy joint counter drug operations leading to the arrest and successful prosecution of narcotic traffickers operating on or near the QIN Reservation.

It is an honor to present this testimony to the House Committee on Appropriations Subcommittee on Commerce, Justice, Science, and Related Agencies. The issues presented to you herein are of utmost concern to us. We are determined to deal with them professionally and effectively and, with your continued support, we will make substantial progress on the objectives presented in a manner, which will positively affect the lives of our children, our elders, and all members of our nation.

Thank you for your consideration and for your efforts to stand up for the rights and needs of our people, and for the implementation of the Federal Trust Responsibility to the Quinault Indian Nation.

PREPARED STATEMENT OF RESTORE AMERICA'S ESTUARIES

Restore America's Estuaries is a nonpartisan, nonprofit organization that has been working since 1995 to restore our nation's greatest estuaries. Our mission is to preserve the nation's network of estuaries by protecting and restoring the lands and waters essential to the richness and diversity of coastal life. Restore America's Estuaries is a national alliance of community-based coastal conservation organizations across the nation that protect and restore coastal and estuarine habitat. Our member organizations include: American Littoral Society, Chesapeake Bay Foundation, Coalition to Restore Coastal Louisiana, Save the Sound—a program of the Connecticut Fund for the Environment, Conservation Law Foundation, Galveston Bay Foundation, North Carolina Coastal Federation, EarthCorps, Save the Bay—San Francisco, Save the Bay—Narragansett Bay, and Tampa Bay Watch. Collectively, we have over 250,000 members nationwide.

For fiscal year 2014, Restore America's Estuaries supports the following funding levels within the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA):

- Habitat Conservation & Restoration—\$47.031 million.
- Estuary Restoration Program—\$1.5 million.

NOAA, HABITAT CONSERVATION AND RESTORATION: COMMUNITY-BASED RESTORATION PROGRAM

NOAA's Habitat Conservation & Restoration provides critically important funding for the Community-based Restoration Program (CBRP) to accomplish on-the-ground projects to restore the nation's coastal, marine, and migratory fish habitat. The program provides technical expertise—including engineering, construction, and monitoring—as well as funding to regional and national partners, and directly to local communities to carry out projects such as marsh and wetlands restoration, small dam removals, and hydrologic re-connections of tidal systems, all of which protect a variety of threatened and/or endangered species, provide healthy outdoor recreational opportunities, and help buffer coastal communities from the threat of erosion and coastal storms. Federal investments in restoration provide long-lasting benefits to local communities and economies.

NOAA's Community-based Restoration Program provides funding through competitively-awarded partnerships. We believe the partnership model is a critical piece of the program's success because it helps to ensure that restoration projects meet community-driven priorities and engage local citizens in the restoration activity. The community-engagement aspect of the program is critical to long-term restoration efforts because restoration projects occur over time and require long-term community support. To date, the program has been highly successful at improving the health of coastal habitats across the nation, benefiting both the environment and the economy through partnerships. By working collaboratively with more than 1,500 organizations, CBRP has funded more than 2,300 small- to mid-scale on-the-ground projects to restore over 97,000 acres of habitat. This work has involved more than 290,000 volunteers in projects, contributing more than 1 million volunteer hours.

CBRP funding accounts for only a very small portion of the total NOAA Federal budget but provides dramatic results in coastal communities. The funding for this program is also very cost-effective, as the Federal investment is matched by local organizations and is used to leverage significantly more private and local investment in our nation's coasts. Depending on the project, Federal funds are leveraged between 3 and 5 times with private, local, and State funds. Maintaining funding for CBRP partnerships that accomplish locally driven restoration and engage communities and citizens is well worth the investment.

The CBRP not only helps to improve the nation's degraded habitats but also helps create jobs and benefit local economies. NOAA data shows that restoration projects create between 17–33 jobs per \$1 million invested.¹ And unlike other sectors, these restoration jobs can't be outsourced and will remain in communities. First there are the immediate local jobs, followed by the significant long-term ecologic and economic benefits. Habitat restoration is critical to sustaining and rebuilding the fish populations needed to support sport fishing opportunities and the commercial fishing industry in the coming years. The resulting healthier habitats strengthen and revitalize America's communities by buffering against storms, preventing erosion, protecting vital infrastructure, eliminating public safety hazards, and providing new recreational opportunities.

Restore America's Estuaries urges your continued support and funding for Habitat Conservation & Restoration and asks that you fund the administration's fiscal year 2014 request of \$47.031 million for Habitat Conservation & Restoration. We also request that you include the following language to ensure NOAA does not divert funding away from the intended purpose, the critically important community-based restoration:

“The restoration of coastal and estuarine habitats is of national importance and essential to the core mission of NOAA to achieve sustainable fisheries and resilient coasts. Within the funds provided, no less than \$15,700,000 shall be made available for partnerships that support local fisheries habitat restoration and shoreline resiliency needs through the Community-based Restoration Program. The Committee recognizes that restoration priorities and projects are best decided by local stakeholders and interests, with technical and scientific expertise provided by NOAA. The Committee expects that NOAA will place greater emphasis on a partnership model that helps ensure habitat restoration projects continue to be driven by local communities and priorities. The committee also recognizes that “large-scale projects” are in fact a collective of multiple small- to mid-scale projects working toward the same goal. The Committee expects NOAA to maintain the small- to mid-scale project focus of CBRP that continues to provide broad ecosystem benefits, involve local commu-

¹ Table 1: <http://www.habitat.noaa.gov/abouthabit/habitatconservationjobs.html> (Accessed March 2013); http://www.habitat.noaa.gov/pdf/RAE_Restoration_Jobs.pdf.

nities, and contribute to larger-scale regional conservation or restoration plans. Projects shall be funded through partnerships to help ensure community engagement and participation which is critical for long-term local stewardship.”

NOAA, ESTUARY RESTORATION PROGRAM

Authorized through the Water Resources Development Act of 2000 and reauthorized by Congress in 2007, the Estuary Restoration Act (ERA) established a comprehensive interagency program for the restoration of the nation’s estuaries. The ERA’s Estuary Habitat Restoration Council, comprised of the five primary Federal restoration agencies (USACE, NOAA, EPA, USFWS, and USDA-NRCS) is leading a coordinated approach to maximize benefits from restoration and address the pressures facing our nation’s estuaries. With declining Federal resources, this level of coordination has never been more important. As current Council Chair, NOAA is leading efforts through the Estuary Restoration Program, while also maintaining an interagency ERA project database that serves as a useful and cost-effective clearinghouse for all agency restoration information. Maintaining funding for this important program is important for continued progress.

In November 2012, the Estuary Habitat Restoration Council approved the 2012 Estuary Habitat Restoration (EHR) Strategy and 5-year action plan. The action plan identifies outcomes and milestones to ensure that restoration efforts are coordinated, evaluated, and tracked across agencies with the goal of ensuring efforts are effective and efficient. Maintaining funding for this important program is important for continued progress.

Restore America’s Estuaries urges your continued support of the Estuary Restoration Council and NOAA’s Estuary Restoration Program and asks that you provide \$1,500,000 in funding for fiscal year 2014.

CONCLUSION

Restore America’s Estuaries greatly appreciates the support this Subcommittee has provided in the past for these important programs. These programs help to accomplish on-the-ground restoration work which results in major benefits:

- Jobs*.—Coastal habitat restoration projects create between 17–33 jobs per \$1 million invested. That’s more than twice as many jobs as the oil and gas sector and road construction industries combined.
- More fish*.—Traditional fisheries management tools alone are inadequate. Fish need healthy and abundant habitat for sustainable commercial and recreational fisheries.
- Resiliency*.—Restoring coastal wetlands can help knock down storm waves and reduce devastating storm surges before they reach the people and property along the shore.
- Leverage*.—Community-based restoration projects leverage 3–5 times the Federal investment through private matching funds, amplifying the Federal investment and impact.

Thank you, Mr. Chairman and we appreciate your taking our requests into consideration as you move forward in the fiscal year 2014 appropriations process. We stand ready to work with you and your staff to ensure the health of our Nation’s estuaries and coasts.

PREPARED STATEMENT OF THE REGIONAL INFORMATION SHARING SYSTEMS PROGRAM

The Regional Information Sharing Systems (RISS) Program helps thousands of criminal justice agencies save lives, solve crimes, and prosecute offenders. RISS has served the nation for almost 40 years, providing secure information and intelligence sharing capabilities, investigative and analytical services, and officer safety deconfliction. During these difficult fiscal times, law enforcement agencies have experienced reductions in funding and manpower. Agencies turn to and rely on RISS for its resources and support. In fiscal year 2012, RISS’s funding was reduced 40 percent, exacerbating an already critical situation. Meanwhile, the demand for RISS’s services continued to increase. “RISS is one of the most cost-effective resources out there.” “RISS is like an extra officer in our department.” “RISS—The most important working tool for law enforcement to combat criminal activity and terrorism.” These statements are examples of what officers are saying about RISS. It is critical that RISS receive appropriate funding to continue its support for these officers and our criminal justice community. It is respectfully requested that you restore RISS’s fiscal year 2013 and fiscal year 2014 funding to its fiscal year 2011 level of \$45 million.

Although a number of RISS's services were reduced or eliminated in fiscal year 2012, RISS strived to maintain its critical services and resources, such as the RISS Secure Intranet (RISSNET), the RISS Criminal Intelligence Databases (RISSIntel), analytical services, and the RISS Officer Safety Event Deconfliction System (RISSafe). Without restored funding, RISS's ability to provide these services, support the growing needs of law enforcement, and respond to the increased demand for services will diminish, ultimately impacting law enforcement efforts to solve crimes and safeguard communities.

RISS consists of six regional centers and the RISS Technology Support Center. The centers tailor their services to meet the needs of their unique regions while working together on nationwide issues. RISS is a proven, innovative, cost-effective, and evidence-based program that is used and trusted by thousands of local, State, Federal, and tribal criminal justice agencies. RISS serves hundreds of thousands of officers and public safety professionals in all 50 States, the District of Columbia, U.S. territories, Australia, Canada, England, and New Zealand. A Nebraska sheriff said, "RISS provides resources that we could not otherwise afford. RISS helps our agency operate more efficiently, and without them, we would not be where we are today."

RISS PROVIDES SECURE INFORMATION, INVESTIGATIVE, AND INTELLIGENCE SHARING CAPABILITIES

Historically, law enforcement and criminal justice agencies encountered obstacles related to information sharing, communications, and technology. Many agencies individually held pieces of information about criminals and their activities but lacked a mechanism to securely collect and exchange information. In 1997, RISS developed RISSNET, a secure infrastructure for law enforcement and criminal justice agencies to share information across jurisdictions. RISSNET is the only nationwide Sensitive But Unclassified (SBU) law enforcement information sharing cloud provider governed by its users. RISSNET houses millions of pieces of data, offers bidirectional sharing of information, and connects disparate State, local, and Federal systems. Agencies can easily connect to RISSNET, share information and intelligence in a secure environment, and query multiple systems simultaneously.

RISSNET also serves as the secure communications infrastructure for a number of critical resources. Currently, 86 systems are connected or pending connection to RISSNET. There are more than 350 RISS and partner resources available via RISSNET to authorized users; the owners of these resources rely on RISSNET for its secure infrastructure. By connecting agencies and systems to RISSNET, hundreds of millions of dollars are saved and millions of data records are easily and quickly accessible by law enforcement. A Pennsylvania police officer said, "Connectivity to RISSNET is absolutely critical to solving multijurisdictional crimes."

The RISSIntel user interface provides for real-time, online federated search of 34 RISS and partner intelligence databases, including State systems, the California gang intelligence system (CalGang), and systems connected via the National Virtual Pointer System (NVPS), and does not require RISSNET users to have a separate user account with the respective partner systems. This simplified sign-on approach enables officers to save time and quickly retrieve information. In fiscal year 2012, RISSIntel contained almost 2.8 million intelligence records (not including those available via connected systems), and users made more than 4.7 million inquiries in RISSIntel.

RISSGang is the only comprehensive gang resource that offers a criminal intelligence database, informational resources, and a secure bulletin board. RISS continues to connect gang systems. In fiscal year 2011, RISS completed a system-to-system interface between RISSIntel/RISSGang and CalGang, enabling users to initiate a federated search. In fiscal year 2012, RISS completed the connection of the Bureau of Alcohol, Tobacco, Firearms and Explosives' GangNET.

RISS ATIX provides a secure platform for law enforcement, public safety, and private sector entities to share disaster, terrorism, and other information. RISS ATIX supports more than 200,000 professionals and consists of more than 40 community groups. RISS ATIX resources include secure Web pages, a discussion forum, a document library, and secure e-mail.

Each RISS Center maintains secure Web sites to provide users with access to RISSIntel and other resources, such as the Cold Case Locator and the RISS Pawnshop Database. The number of investigative records available through these different systems exceeds 28 million.

RISS'S NATIONWIDE IMPACT

RISS's unique structure helps meet the needs of local, State, and tribal law enforcement while partnering with Federal agencies on a number of nationwide initiatives. For example, RISS is the only non-Federal entity participating in the Assured SBU Interoperability Initiative under the auspices of the White House and the Office of the Program Manager, Information Sharing Environment (PM-ISE). This initiative seeks to expand federated access to resources and to provide simplified sign-on capabilities for officers to access multiple systems simultaneously. RISS is at the forefront in providing simplified, federated access. More than 10,000 users from trusted partner systems are using Federated Identity to access RISSNET resources.

RISS currently supports 1,072 Federal member agencies. Examples of RISS's partnerships with Federal agencies and programs include the PM-ISE, the United States Attorneys' Offices, the U.S. Department of State, the Diplomatic Security Offices, the United States Secret Service's Targeted Violence Information Sharing System, the U.S. Postal Inspection Service, and the National Motor Vehicle Title Information System. RISS supports the Nationwide Suspicious Activity Reporting Initiative by connecting systems to RISSNET and hosting State servers. RISS built and hosts the NVPS Message Hub. There are 10 databases connected through NVPS. RISS continues to connect fusion centers to RISSNET and integrate RISS services into fusion center operations. RISS was mentioned in the National Strategy for Information Sharing and Safeguarding, released by the White House in December 2012.

RISS continuously seeks and is sought out by others to enable new information sharing partnerships that leverage its secure SBU capabilities. For example, several State Medicaid Fraud Control Units are using RISSNET to securely share information. More than 26 secure collaboration sites are housed on RISSNET.

RISS is supported by many organizations, including the International Association of Chiefs of Police, the National Sheriffs' Association, the National Narcotic Officers' Associations' Coalition, and the National Alliance of Gang Investigators Associations. RISS's partnerships have resulted in an unprecedented level of information and intelligence sharing.

RISS ENHANCES OFFICER SAFETY THROUGH DECONFLICTION

More than 19,000 law enforcement officers have died serving our nation. At the current rate, one officer is killed every 53 hours in the United States. Officer safety is of paramount importance to the law enforcement community and the citizens they serve. RISSafe is an essential component in helping ensure officer safety. RISSafe stores and maintains data on planned law enforcement events and identifies and alerts affected agencies and officers of potential conflicts impacting law enforcement efforts. Since RISSafe's inception in 2008, more than 615,000 operations have been entered, resulting in more than 208,000 identified conflicts. Currently, 23 RISSafe Watch Centers are operational, 17 of which are operated by organizations other than RISS, such as State agencies, fusion centers, and High Intensity Drug Trafficking Areas (HIDTA). These organizations have invested resources to support this critical program. The interaction between RISSafe and RISSIntel provides comprehensive officer safety event and subject deconfliction services. Many agencies have adopted policies mandating the use of RISSafe. In fiscal year 2012, RISS introduced RISSafe Mobile, which enables officers to access RISSafe from their smartphones and other mobile devices.

RISSafe is the only comprehensive and nationwide deconfliction system that is accessible and monitored on a 24/7/365 basis and available at no cost to all law enforcement agencies regardless of RISS membership. It is impossible to put a cost to the number of officers RISSafe has already prevented from harm or, worse, death. A Washington police officer said, "RISS services are the basis of our department's information and intelligence-led policing efforts and also provide the critical deconfliction component vital to the safety of our officers in the field."

RISS launched the RISS Officer Safety Website, which serves as a nationwide repository for issues related to officer safety, such as concealments, armed and dangerous threats, officer safety videos, special reports, and training.

RISS PROVIDES CRITICAL AND DIVERSE INVESTIGATIVE SUPPORT

Many law enforcement agencies still do not have the support, resources, and/or funding to obtain analytical services, purchase investigative and surveillance equipment, send officers and personnel to training, research volumes of data, and develop intelligence briefings and other law enforcement-sensitive documents. RISS offers full-service delivery, from the beginning of an investigation to the ultimate prosecu-

tion and conviction of criminals. Using RISS's resources and services enables officers to:

- Simultaneously query connected intelligence databases via RISSNET.
- Retrieve information from specialized and investigative databases and resources.
- Use analytical products such as crime scene diagrams, link-analysis charts, digital forensics, and audio/video services to aid in arresting and prosecuting offenders.
- Request assistance from research staff to help sift through information, conduct research, and help identify the missing piece of the puzzle.
- Borrow specialized surveillance and investigative equipment, such as global positioning systems, customized cameras, and recording devices.
- Obtain training on new and emerging topics, such as social media, domestic terrorism organizations, and border and immigration.
- Access critical publications and law enforcement-sensitive briefings, including topics such as sovereign citizens, gun violence, narcotics, and human trafficking.

In fiscal year 2012, the RISS Centers developed 32,657 analytical products, loaned 4,597 pieces of specialized equipment, responded to 184,553 requests for research assistance, and trained 53,308 individuals. RISS is an excellent return on investment for our nation. Over the last 10 years, officers leveraging RISS's services arrested more than 48,000 offenders and seized more than \$662.3 million in narcotics, property, and currency. Statistics are only one way to see the value of RISS; the real successes come directly from agencies and officers. To view success stories from your State as well as other information regarding RISS, please visit www.riss.net/Impact.

It is respectfully requested that Congress restore fiscal year 2013 and fiscal year 2014 funding for RISS to the fiscal year 2011 amount of \$45 million so that this essential information sharing and public safety program can continue to serve our nation. Inadequate funding and support for RISS could diminish the nation's information sharing environment, hinder investigations, and impact the safety of our communities. It would be counterproductive to require local and State RISS members to self-fund match requirements, as well as to reduce the amount of Bureau of Justice Assistance discretionary funding. Agencies require more, not less, funding to fight the nation's crime problem. RISS is unable to make up the decrease in funding that a match would cause, and it has no revenue source of its own. RISS is A Proven Resource for Law Enforcement. Its services increase the ability to detect, prevent, identify, solve, and prosecute crime while creating a safer working environment for our nation's law enforcement. RISS is grateful to provide this testimony and appreciates the continued support of this committee.

PREPARED STATEMENT OF THE SAC AND FOX NATION

Chairman Wolfe and distinguished members of the subcommittee, my name is George L. Thurman, and I am the Principal Chief of the Sac and Fox Nation. I thank you for the opportunity to present the Sac and Fox Nation's testimony before this esteemed Committee. We appreciate your dedication to Indian programs and respectfully submit a Tribal Specific Budget Request in the amount of \$4.8 million to fully fund the Sac and Fox Nation Juvenile Detention Center. We understand the fiscal constraints of the Country and together we can provide a future that has many opportunities for self-sufficiency through Self-Governance.

ABOUT THE SAC AND FOX NATION

The Sac and Fox Nation is headquartered in Stroud, Oklahoma, and our Tribal jurisdictional area covers Lincoln, Payne, and Pottawatomie Counties. Of the 4,000 enrolled Tribal members, 2,600 live in Oklahoma. We are proud to pay tribute to a Sac and Fox descendent and Great Native American, Jim Thorpe. One of the most revered Olympic athletes who has ever represented the United States, Mr. Thorpe won the pentathlon and decathlon in the 1912 Olympics.

TRIBAL SPECIFIC BUDGET REQUESTS—\$4.8 MILLION FOR JUVENILE DETENTION CENTER

The passage of the Tribal Law and Order Act was applauded by the Sac and Fox Nation because we saw this as the opportunity for the Federal Government to finally fulfill the commitment to the Nation and fully fund our Juvenile Detention Center (JDC). In 1994, the Sac and Fox Nation JDC opened its doors after years of planning and construction made possible by funding from the Department of the Interior, Bureau of Indian Affairs. The JDC is the first juvenile facility designed for

American Indians/Alaska Natives as well as the first juvenile facility developed under Public Law 100-472, the Self-Governance Demonstration Project Act. The JDC is a full service, 24-hour juvenile detention facility that provides basic detention services to all residents to ensure their health, safety and welfare and programs tailored to meet the specific needs of our clients.

These programs include behavioral management, substance abuse, spiritual, cultural, self-esteem, arts and crafts, health and fitness, horticulture, nutrition, life skills, counseling and educational programs. The 39 Tribes included in the Southern Plains Region are willing to support the JDC but due to underfunding and staffing shortages, the JDC cannot accommodate the detention needs of the regional Tribes.

In fiscal year 2013 appropriations testimony provided by Assistant Secretary Larry Echo Hawk, he requested \$6.5 million for Detention/Correction and an additional 18 FTEs. We take great exception to the this request inasmuch as the Department of the Interior/Bureau of Indian Affairs has never provided the full appropriations that were authorized for the planning and construction phases of the JDC. The Sac and Fox Nation, due to the failure of the full funding commitment by Federal officials not being honored, has had to utilize funds that could have been used for other social services needs. The Sac and Fox Nation is committed to working with the Federal Government in an effort to help them fulfill their financial commitment. With the promise of full funding realized, the JDC will be ready, willing and able to meet the needs of Tribes who need our help in guiding their children toward a successful future while providing a culturally and spiritually sensitive environment. However, the needs of these Tribes and the children we serve will continue to be unmet as long as new facilities are continually funded and constructed without funding for operations.

In fiscal year 2004, the Office of the Inspector General issues the report, "Neither Safe nor Secure"—An Assessment of Indian Detention Facilities, citing the existence of serious safety, security, and maintenance deficiencies at detention centers throughout Indian Country. One of the primary recommendations was the need to identify and remedy staffing shortages whereby Indian Affairs responded that "current facilities still remain understaffed by a total of 373 positions (74 positions for Indian Affairs direct service programs and 299 positions for programs operated by Tribes under Public Law 93-638 and Self-Governance compacts).¹

There is an opportunity for you as the Legislative Branch of the United States of America to work with the Sac and Fox Nation to improve the lives of Indian children that have made poor choices. These choices are usually based on the absence of guidance, culture, and discipline. The Sac and Fox Nation JDC is committed to the rehabilitation of our Native children. Fully funding the JDC will offer each juvenile the opportunity to receive continuing education through a local high school. The students are afforded everything provided by a public school, including a graduation ceremony if they successfully achieve the State requirements. The possibilities are endless but are unrealized because despite of tribal funds and various grants, the funding is inadequate to operate the facility.

Therefore, the Sac and Fox Nation is requesting that the Federal Government recommit to funding for the JDC in the amount of \$4.8 million.

The Sac and Fox Nation is proud to be a Self-Governance Tribe. Thank you.

PREPARED STATEMENT OF THE SOCIETY FOR NEUROSCIENCE

Mr. Chairman and members of the Subcommittee, my name is Larry Swanson, Ph.D. I am the Milo Don and Lucille Appleman Professor of Biological Sciences at University of Southern California. Over the past 30 years, my work has focused on the structure and organization of neural structures involved in motivated and emotional behaviors, as well as the development of a wiring diagram of the nervous system more generally. This statement is in support of increased funding for the National Science Foundation (NSF) for fiscal year 2014.

On behalf of the nearly 42,000 members of the Society for Neuroscience (SfN), thank you for your past support of neuroscience research at NSF. SfN's mission is to advance the understanding of the brain and the nervous system; provide professional development activities, information and educational resources; promote public information and general education; and inform legislators and other policymakers.

This is an exciting time to be a neuroscientist. Advances in understanding brain development, imaging, genomics, circuit function, computational neuroscience, neural engineering, and many other disciplines are leading to discoveries that were impossible even a few years ago. Many of these discoveries are being made by

¹ Fiscal Year 2013 U.S. Department of the Interior Budget Justifications—Green Book.

neuroscientists who can trace their first grant back to NSF on their way to becoming independently funded investigators.

SfN is appreciative that President Obama recognizes brain science as one of the great scientific challenges of our time. The recently announced Brain Research through Application of Innovative Neurotechnologies (BRAIN) Initiative will enable NSF and other Federal agencies to develop initial tools and conduct further planning that will help accelerate fundamental discoveries and improve the health and quality of life for millions of Americans.

The field of neuroscience is poised to make revolutionary advances thanks to decades of global investment and path-breaking research. However, realizing this potential means today's critical seed funds must be backed by sustained, robust investment in the scientific enterprise, and SfN is encouraged by the President's request for an increase to the budget of NSF.

Resources provided to NSF support the nation's best and brightest researchers at the forefront of promising discoveries, graduate students at the start of their careers, and the development of scientific tools and infrastructure that will be available to researchers. These researchers are the ones who will be answering some of the vexing questions facing the field of neuroscience: what are the genetic, cellular, and molecular mechanisms responsible for brain development? How do biology and our external environment and stimuli intersect to affect the way our brains function? How will new tools such as brain-machine interfaces, computational models, and advanced imaging techniques enhance the effectiveness of the field, deepen scientific capacity for inquiry, and contribute to better health and quality of life in the years ahead?

Now is the time to take advantage of scientific momentum, to pave the way for improved human health, to advance scientific discovery and innovation, and to promote America's near-term and long-range economic strength. These goals require robust investments in NSF that reverse the tide of stagnant and shrinking funding. Virtually every directorate at NSF supports neuroscience research. NSF continues to search for new ways to encourage and incentivize creativity and integration across disciplines when it comes to neuroscience. This is evident in the recent NSF "Dear Colleague Letter" aimed at "Accelerating Integrative Research in Neuroscience and Cognitive Science." SfN is very grateful for NSF's continued recognition of and support for cross-disciplinary approaches, and we believe neuroscience is an exceptional example of ways the life and physical sciences intersect and complement one another.

Seizing this moment can only happen if labs are able to pursue promising leads and innovative ideas can move forward. A constricted fiscal environment—compounded by sequestration—could stand in the way of that progress. It's impossible to say what breakthroughs will go undiscovered, but there is no doubt that this fiscal environment will result in delayed discoveries, with potentially huge opportunity costs for human health and the creation of new technologies based on models of neural network computation.

FISCAL YEAR 2014 BUDGET REQUEST

SfN supports President Obama's request of \$7.626 billion for NSF, an 8.4 percent increase over fiscal year 2012. Let's work to put research on a trajectory of sustained growth that recognizes the promise and opportunity for improving the lives of Americans and as a tool for economic growth.

Sustained growth in funding will enable the field to serve the long-term needs of the nation by continuing to advance science, improve lives, and promote America's near-term and long-range economic strength by investing in the proven economic engine of discovery. Continued investment in basic research at NSF is essential to laying the groundwork for discoveries that will inspire scientific pursuit and technological innovation for future generations.

As noted above, NSF is a primary catalyst for understanding the connection between life sciences and physical sciences. Whereas the National Institutes of Health (NIH) may focus on basic research with an orientation toward a disease or health-related focus, NSF-supported neuroscience research is more likely to focus on specific functions of the brain, not necessarily tied to a specific disease or disorder. What's more, the "physical sciences" work supported by NSF has enabled the development of new technologies that have revolutionized neuroscience research in recent years.

Aggressive investment in technology and scientific research is crucial to ensure America sustains its global leadership and competitiveness. Science is now a truly global enterprise that has the potential to revolutionize human knowledge, health,

and wellness—the question is whether the U.S. will maintain its role leading the next generation of scientific advances.

As the committee works to set funding levels for critical research initiatives for fiscal year 2014 and beyond, we ask you to help establish a national commitment to advance the understanding of the brain and the nervous system—an effort that will transform the lives of millions of people living with diseases and disorders of the nervous system and perhaps inspire the next generation of computing devices. Help us to fulfill our commitment to overcoming the most difficult obstacles impeding progress and to identifying critical new directions in basic neuroscience.

NEUROSCIENCE AND NSF

SfN supports an increase in the budget of NSF because NSF-funded research is at the forefront of improving our understanding of neuroregeneration and rehabilitation, neuroimaging, and brain-computer interface to name but a few.

The power of fundamental science unlocks the mysteries of the human body by exploring the structure and function of molecules, genes, cells, systems, and complex behaviors. Every day, neuroscientists advance scientific knowledge and medical innovation by expanding our knowledge of the human brain. Basic (also known as fundamental) research funded by the NSF continues to be essential for discoveries that will inspire scientific pursuit and medical progress for generations to come. Due to federally-funded research, scientists and healthcare providers have a much better understanding of how the brain functions.

NSF-supported work is essential for the future of neuroscience. For example, the “brainbow” uses complex genetic engineering to label neighboring neurons in different colors, making them easier to differentiate and trace their connections. Such advances have only been possible within the last decade. But being able to trace these connections also highlights an increasingly common and complex problem—how to handle vast amounts of data that are collected. To store the images necessary to form a picture of 1 cubic millimeter of a mouse brain—about the size of the eye of a needle—would require the equivalent of 212,000 DVDs. NSF is leading the way in such computational research.

We cannot rely on private industry to fund these ideas. Given the long-term path of basic science and industry’s need for shorter-term return on investment, private industry depends on federally-funded research to create a strong foundation for applied research. As noted in a report issued by NSF in November 2012, research and development through universities, much of it driven by NSF, totaled more than \$65 billion in fiscal year 2011. The life sciences were a primary driver of that growth. This demonstrates how investment in basic research acts as a “force multiplier,” and why increasing investment in research—from the most basic to the translational—is so essential.

The following are just two of the many basic research success stories in neuroscience emerging now thanks to strong historic investment in NSF and other research agencies:

The “Connectome”

Current knowledge about the intricate patterns connecting brain cells (the “connectome”) is extremely limited. Yet identifying these patterns and understanding the fundamental wiring diagram or architectural principles of brain circuitry are essential to understanding how the brain functions when healthy and how it fails to function when injured or diseased. Recent research suggests that some brain disorders, like autism and schizophrenia, may result from errors in the development of neural circuits. This research suggests a new category of brain disorders called “disconnection” syndromes.

While connectome research is primarily supported by NIH, key tools developed through NSF-sponsored research are essential to the project’s success. The development of advanced technologies, along with faster and more data-efficient computers, now make it possible to trace the connections between individual neurons in animal models providing us with greater insight into brain dysfunction in mental health disorders and neurological disease. Scientists have already used these technologies to examine disease-related circuitry in rodent models of Parkinson’s disease. Their findings helped explain how a new treatment called deep brain stimulation works in people, and are being explored for treatments of other diseases.

Brain-Machine Interface

NSF supported research on human-centered computing (HCC) has played a critical role in efforts to restore motor control to the almost 2 percent of the U.S. population affected by some sort of paralysis, be it a result of stroke, spinal cord or brain injury or other causes. Paralysis occurs when the link between the brain and a part

of the body is severed, eliminating the control of movement and the perception of feeling in that area. Previous research has focused on understanding the mechanisms by which the brain controls a movement. Research during which scientists were able to record the electrical communication of almost 50 nerve cells at once showed that multiple brain cells work together to direct complex behaviors. However, in order to use this information to restore motor function, scientists needed a way to translate the signals that neurons give into a language that an artificial device could understand and convert to movement.

Basic science research in mice lead to the discovery that thinking of a motion activated nerve cells in the same way that actually making the movement would. Further studies showed that a monkey could learn to control the activity of a neuron, indicating that people could learn to control brain signals necessary for the operation of robotic devices. Thanks to these successes, brain-controlled prosthetics are being tested for human use. Surgical implants in the brain can guide a machine to perform various motor tasks such as picking up food to eat. These advances, while small, are a huge improvement for people suffering from paralysis. Scientists hope to eventually broaden the abilities of such devices to include thought-controlled speech and more. Further research supported by NSF is working on developing non-invasive interfaces for human-machine communication as well as providing tactile feedback. Understanding how neurons control movement has had and will continue to have profound implications for victims of paralysis.

A common theme of both these examples of basic research success stories is that they required the efforts of basic science researchers discovering new knowledge, of physician scientists capable of adapting those discoveries into better treatments for their patients, and of companies willing to build on all of this knowledge to develop new medications and devices.

THE FUTURE OF AMERICAN SCIENCE

As the subcommittee considers this year's funding levels, please consider that significant advancements in the biomedical sciences often come from young investigators. The current funding environment is taking a toll on the energy and resilience of these young people. America's scientific enterprise—and its global leadership—has been built over generations. NSF alone has awarded over 46,500 Graduate Research Fellowships since 1952. Many young scientists receive their first grants from NSF on their way to having careers as independently funded investigators. Without sustained investment, we will quickly lose that leadership. The culture of entrepreneurship and curiosity-driven research could be hindered for decades.

We live at a time of extraordinary opportunity in neuroscience. A myriad of questions once impossible to consider are now within reach because of new technologies, an ever-expanding knowledge base, and a willingness to embrace many disciplines.

To take advantage of the opportunities in neuroscience we need an NSF appropriation that allows for sustained, reliable growth. We have entered an era where knowledge of nerve cell and circuit function has brought us to the threshold of a more profound understanding of behavior and of the mysteries of the human mind. This understanding, in turn, will have profound benefits for the American public and will help maintain American leadership in science worldwide. Thank you for this opportunity to testify.

PREPARED STATEMENT OF THE SEA GRANT ASSOCIATION

Madam Chair and members of the Subcommittee, my name is LaDon Swann and I am the Director of the Alabama-Mississippi Sea Grant Consortium. I submit this testimony in my capacity as President of the Sea Grant Association (SGA). The SGA appreciates very much the steadfast support this Subcommittee has provided the National Sea Grant College Program over the years. As a result, Sea Grant has been able to deliver a number of quantifiable benefits to the residents of our ocean and coastal communities, which are documented below.

To continue to achieve a high rate of return on Federal investment and to produce meaningful and quantifiable benefits to coastal residents in the future, the SGA recommends that the National Sea Grant College Program within NOAA be funded in fiscal year 2014 at the President's request of \$72.7 million. The request is consistent with the guidance provided in the fiscal year 2012 conference report that said:

“The Committee recognizes the important role the Sea Grant program plays in connecting coastal and Great Lakes communities with practical research and results, and encourages the growth of this program in future budget requests.”

The National Sea Grant College Program addresses national priorities at the local level, by identifying citizens' needs in order to help guide State and national research agendas. Sea Grant funds the best competitive science at our Nation's colleges and universities. The scientific discovery is effectively delivered through Sea Grant's robust extension, outreach and education programs to inform public and private decisionmaking in order to enhance the practical use and conservation of coastal, marine, and Great Lakes resources while also expanding economy and maintaining a sustainable environment.

As part of the administration's proposal to consolidate the various Science, Technology, Engineering, and Mathematics (STEM) education programs within various agencies, the administration has proposed the termination of the John A. Knauss Marine Policy Fellowship Program, the Sea Grant-NMFS Fellowship program and Sea Grant's formal K-12 and informal public education programs in Sea Grant. The Sea Grant Association strongly opposes the termination of the education programs within the National College Sea Grant Program and asks the Congress to restore \$4 million worth of funding for these Sea Grant education programs.

Education (particularly STEM education) within the Sea Grant program is explicitly authorized in the legislation enacted by Congress to create the Sea Grant program. The Sea Grant statute recognizes and reinforces the linkage between research, education and extension by relying on the land-grant college and university model of research and education in service to the public.

Sea Grant has been a leader in workforce development opportunities through two very important fellowship programs. The Sea Grant Knauss Fellowship Program provides a unique education experience to students who have an interest in ocean, coastal, and Great Lakes resources and in the national policy decisions affecting those resources. The program matches highly qualified graduate students with "hosts" within relevant Federal agencies and the Congress for a 1-year paid fellowship. The Sea Grant Knauss Fellowship Program is an integral part of the Sea Grant program because it integrates research, education, and public policy in a unique, highly effective way. Since the start of the Sea Grant Knauss Fellowship Program in 1979 more than 900 graduate students have participated in this program. Many former Fellows have obtained public and private sector leadership positions in marine policy, marine science and technology.

The Sea Grant-NOAA Fisheries fellowship program responds to increasing legislative and management demands on NOAA for better understanding of fish populations as well as social and economic conditions in fishing communities. A National Research Council report and 2008 report to Congress highlight the growing and unmet need for Federal experts in fisheries stock assessments and economics. They discuss the critical national role of such experts in maintaining healthy marine population stocks and the \$42 billion commercial fishing industry. The Sea Grant-NOAA Fisheries fellowship program encourages Ph.D. candidates to pursue careers in population dynamics, stock assessment and marine resource economics. Co-funded by the two agencies, the program makes a unique contribution to Federal workforce capacity and builds scientific collaboration between academic and NOAA Fisheries scientists.

Over the longer-term Sea Grant's support of formal K-12 Education has helped thousands of students to pursue careers in STEM. Sea Grant sponsored education programs are aligned with national and State education standards and in many States have been the cornerstone to K-12 marine science curricula. Sea Grant's informal education programs through its association with marine labs, aquaria, and coastal ecosystem learning centers have proved valuable in effecting positive behavior changes on youth and adults.

The Federal cost for these two fellowship programs and other vital Sea Grant education activities is estimated at \$4.0 million. The SGA strongly believes that what the Nation gets back over time in formal and informal STEM education and the training of marine policy and fisheries professionals is well worth the modest investment as an integral part of the National Sea Grant College Program. We hope the Subcommittee will support the reinstatement of these effective fellowship programs and highly targeted STEM education activities in Sea Grant as it reviews the administration's proposal.

THE RETURN ON INVESTMENT TO THE NATION THROUGH SEA GRANT

To those who ask if this Federal program is delivering value and results to the taxpayer—we believe the answer is a resounding "yes." Highlights from the National Sea Grant Advisory Board's 2012 Biennial Report to Congress clearly demonstrates Sea Grant's important benefits to the Nation and the high return on its Federal investment:

- \$170 million in direct economic benefits to the Nation, which represents nearly a 2.5 to 1 return on the Federal investment;
- 630 new businesses were created or retained, and more than 3,800 jobs were created or retained due to Sea Grant efforts;
- 900 communities across the Nation have adopted more sustainable economic or environmental development practices and policies; and
- Sea Grant expanded the Nation's workforce by supporting more than 1,000 undergraduate and more than 950 graduate students, resulting in 350 graduate or undergraduate degrees awarded.

Approximately 95 percent of the Federal funding provided to Sea Grant leaves Washington and goes primarily to State university-led programs where it is used to conduct research, carry out extension and outreach activities, and deliver valuable services to States that participate in this program. In addition, Federal funding through the Sea Grant program has a significant leveraging impact with every two Federal dollars invested attracting at least an additional dollar in non-Federal resources in matching funding.

For more than 40 years, the National Sea Grant College Program has worked with its university partners to create and maintain a healthy coastal environment and a robust and productive coastal economy. The Sea Grant network includes more than 30 programs based at top universities in every coastal and Great Lakes State, Puerto Rico, and Guam. Sea Grant brings the robust intellectual capacity that we have within our universities to bear to solve important societal problems and expand our Nation's work force. The programs within the Sea Grant network help citizens and businesses understand, conserve, and better utilize America's coastal, ocean and Great Lakes resources. Through a partnership between universities and the NOAA, Sea Grant directs Federal resources to pressing problems in local communities. The partnership with universities is a great source of efficiency, which differentiates it from other NOAA coastal programs. By drawing on the experience of more than 3,000 scientists, engineers, public outreach experts, educators and students from more than 300 institutions, Sea Grant is able to make an impact at local and State levels, and serve as a powerful national force for change.

THE ECONOMIC IMPORTANCE OF THE NATION'S COASTAL COMMUNITIES

It is important to recognize that 52 percent of the Nation's total population lives in coastal watershed counties. The Nation's coastal population increased by nearly 51 million people from 1970 to 2010 and by 2020, the coastal population is expected to grow by another 10 percent or 15.6 million. According to NOAA, the coastal economy contributed \$8.3 trillion to the Nation's Gross Domestic Product resulting in 66 million jobs and wages worth an estimated \$3.4 trillion.

Recreational coastal fishing contributed about \$73 billion in total economic impact supporting over 320,000 jobs. For commercial fishing, the average annual value of all U.S. marine fisheries from 2008 to 2010 is estimated at \$4 billion providing about 1 million jobs and generating over \$32 billion in income.

Our Nation's ports, often located in the heart of sensitive coastal ecosystems, are an essential driver of the U.S. economy. About \$1.9 trillion worth of imports came through U.S. ports in 2010 supporting an estimated 13 million jobs.

Over 50 percent of the total energy produced domestically occurred in coastal States including natural gas production, electricity generation, and oil and gas production. Coastal areas are providing opportunities for renewable energy development with projects that seek to extract energy from the movement of ocean water due to tides, currents, or waves; from the temperature differential between hot and cold ocean water; and from strong winds in offshore ocean environments.

In 2010 over 13.5 million people in the U.S. were employed in the tourism industry in coastal States and communities (transportation, lodging, food services, entertainment, and retail) in over 750,000 business establishments, earning combined wages of \$266 billion. The total economic value generated by the U.S. coastal tourism industry in 2010 has been estimated at \$531 billion.

THE ROLE OF SEA GRANT IN SUPPORTING THE NATION'S COASTAL COMMUNITIES— INCREASING COASTAL RESILIENCY

In addition to the annual positive scientific and economic impacts delivered by the National Sea Grant College Program, the relationships formed in coastal communities and with local stakeholders have proved extremely beneficial and supportive in disaster response. Beginning with hurricane Katrina and including the major disasters of the Deepwater Horizon oil spill and most recently hurricane Sandy, the Sea Grant network has provided substantial and much needed "boots-on-the-ground" assistance to affected communities. Following each of these disasters, it was

often Sea Grant extension, outreach and education programs that brought the first response to these impacted communities.

Sea Grant works with Federal and State agencies to provide critical information following natural and man-made disasters. In the wake of these events, Sea Grant programs assist impacted communities and States by facilitating community planning and capacity building by working with Department of Commerce Disaster Response Teams, Federal Emergency Management Agency (FEMA) mitigation assessment teams, State resource agencies for fishery and aquaculture impacts, local governments, as well as others in addressing coastal impacts.

Immediately following every event, Sea Grant extension professionals and scientists were there, helping communities assess impacts to coastal businesses including local marinas, aquaculture businesses and commercial fishing. Sea Grant also helped determine the extent of changes in coastal geology, barrier islands, beach erosion, and sand dune migration. Sea Grant capabilities allow the program to provide expertise and experience in assessing other environmental impacts such as marine debris and changes to water quality. Sea Grant adds to its ongoing efforts of providing coastal communities with technical assistance, helping to prepare community recovery plans, long-term resilience plans, and explaining the consequences of future mitigation choices ranging from seawalls to green infrastructure. Sea Grant has expanded its role to include the development of tools and programs for addressing the long-term health impacts of disasters on coastal residents.

The funding in the President's fiscal year 2014 request for Sea Grant will allow the program to strengthen its focus on the development of more resilient coastal communities. Specific areas of competitive research to be supported within this focus area will include:

- Marine-related energy sources and efficiency;
- Wise use of water resources;
- Climate adaptation;
- Coastal processes studies;
- Resilience from natural hazards;
- Technology development; and
- Resilient coastal businesses and industries, including fisheries and tourism.

CONCLUDING THOUGHTS

America must use its coastal resources wisely to increase the economic development and resilience of our coastal communities while sustaining the health and productivity of the ecosystems on which they depend.

With the administration's fiscal year 2014 request of \$72.7 million for Sea Grant, the National Sea Grant College Program will be uniquely positioned to continue to make significant contributions to improve the lives and livelihoods of the Nation's coastal communities. We hope the Subcommittee will be able to support this request plus restore the \$4 million the administration eliminated from Sea Grant STEM education programs, including the Sea Grant Knauss Fellowship Program and the joint Sea Grant-NMFS Fellowship Program.

Thank you for the opportunity to present these views. The SGA would be happy to answer questions or provide additional information to the Subcommittee.

PREPARED STATEMENT OF THE SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS

Summary: This written testimony is submitted on behalf of the Society for Industrial and Applied Mathematics (SIAM) to ask you to continue your support of the National Science Foundation (NSF) in fiscal year 2014 by providing NSF with the highest possible funding level. In particular, we urge you to provide strong support for key applied mathematics and computational science programs in the Division of Mathematical Sciences and the Division of Advanced Cyberinfrastructure.

Full Statement: We are submitting this written testimony for the record to the Subcommittee on Commerce, Justice, Science, and Related Agencies of the Committee on Appropriations of the U.S. Senate on behalf of the Society for Industrial and Applied Mathematics (SIAM).

SIAM has approximately 14,000 members, including applied and computational mathematicians, computer scientists, numerical analysts, engineers, statisticians, and mathematics educators. They work in industrial and service organizations, universities, colleges, and government agencies and laboratories all over the world. In addition, SIAM has almost 500 institutional members, including colleges, universities, corporations, and research organizations.

First, we would like to emphasize how much SIAM appreciates your Committee's continued leadership on and recognition of the critical role of the National Science

Foundation (NSF) and its support for mathematics, science, and engineering in enabling a strong U.S. economy, workforce, and society.

Today, we submit this testimony to ask you to continue your support of NSF in fiscal year 2014 and beyond. In particular, we request that you provide NSF with the budget request level of \$7.625 billion.

As we are reminded every day, the nation's economic strength, national security, and public health and welfare are being challenged in profound and unprecedented ways. Addressing these challenges requires that we confront fundamental scientific questions. Computational and applied mathematical sciences, the scientific disciplines that occupy SIAM members, are particularly critical to addressing U.S. competitiveness and security challenges across a broad array of fields: medicine, engineering, technology, biology, chemistry, computer science, and others. SIAM recognizes the challenging fiscal situation, and notes that in the face of economic peril, Federal investments in mathematics, science, and engineering remain crucial as they power innovation and economic growth upon which our economy and fiscal health depend.

NATIONAL SCIENCE FOUNDATION

NSF provides essential Federal support for applied mathematics and computational science, including more than 60 percent of all Federal support for basic academic research in the mathematical sciences. Of particular importance to SIAM, NSF funding supports the development of new mathematical models and computational algorithms, which are critical to making substantial advances in such fields as neuroscience, energy technologies, genomics, analysis and control of risk, and nanotechnology. In addition, new techniques developed in mathematics and computing research often have direct application in industry. Modern life as we know it—from search engines like Google to the design of modern aircraft, from financial markets to medical imaging—would not be possible without the techniques developed by mathematicians and computational scientists. NSF also supports mathematics education at all levels, ensuring that the next generation of the U.S. workforce is appropriately trained to participate in cutting-edge technological sectors and that students are attracted to careers in mathematics and computing.

Below are highlights of the main budgetary and programmatic components at NSF that support applied mathematics and computational science.

NSF Division of Mathematical Sciences

The NSF Division of Mathematical Sciences (DMS) in the Directorate for Mathematical and Physical Sciences (MPS) provides the core support for all mathematical sciences. DMS supports areas such as algebra, analysis, applied mathematics, combinatorics, computational mathematics, foundations, geometry, mathematical biology, number theory, probability, statistics, and topology. In addition, DMS supports national mathematical science research institutes; infrastructure, including workshops, conferences, and equipment; and postdoctoral, graduate, and undergraduate training opportunities.

The activities supported by DMS and performed by SIAM members, such as modeling, analysis, algorithms, and simulation, provide new ways of obtaining insight into the nature of complex phenomena, such as the power grid, software for military applications, the human body, and energy efficient building systems. SIAM strongly urges you to provide DMS with the budget request level of \$244.54 million to enable sustained investment by NSF in critical mathematical research and related mathematical education and workforce development programs.

In particular, investment in DMS is critical because of the foundational and cross-cutting role that mathematics and computational science play in sustaining the nation's economic competitiveness and national security, and in making substantial advances on societal challenges such as energy, the environment, and public health. NSF, with its support of a broad range of scientific areas, plays an important role in bringing U.S. expertise together in interdisciplinary initiatives that bear on these challenges. DMS has traditionally played a central role in such cross-NSF efforts, with programs supporting the interface of mathematics with a variety of other fields. SIAM endorses DMS participation in NSF-wide initiatives such as Secure and Trustworthy Cyberspace (SaTC), to advance cybersecurity, and Cyber-enabled Materials and Manufacturing for Smart Systems (CEMMSS), to develop computational tools for transforming materials discovery. SIAM also supports strong, continued investments in core DMS programs that underpin NSF's essential mathematical science research activities.

NSF Division of Advanced Cyberinfrastructure

Work in applied mathematics and computational science is critical to enabling effective use of the rapid advances in information technology and cyberinfrastructure. Programs in the NSF Division of Advanced Cyberinfrastructure (ACI) in the Directorate for Computer and Information Science and Engineering (CISE) focus on providing research communities access to advanced computing capabilities to convert data to knowledge and increase our understanding through computational simulation and prediction.

SIAM strongly urges you to provide ACI with the budget request level of \$221.35 million to invest in the computational resources and science needed to solve complex science and engineering problems. In addition, SIAM strongly endorses ACI's role as steward for computational science across NSF, strengthening NSF support for relevant activities and driving universities to improve their research and education programs in this multidisciplinary area.

SIAM strongly supports ACI data activities, including data infrastructure, tools, and repositories, as well as the NSF-wide Big Data initiative. The explosion in data available to scientists from advances in experimental equipment, simulation techniques, and computer power is well known, and applied mathematics has an important role to play in developing the methods and tools to translate this shower of numbers into new knowledge. The programs in ACI that support work on software and applications for the next generation of supercomputers and other cyberinfrastructure systems are also very important to enable effective use of advances in hardware, to facilitate applications that tackle key scientific questions, and to better understand increasingly complex software systems.

SIAM continues to support the agency-wide initiative Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21). This program works to develop comprehensive, integrated, sustainable, and secure cyberinfrastructure to accelerate research and capabilities in computational and data-intensive science and engineering.

SUPPORTING THE PIPELINE OF MATHEMATICIANS AND SCIENTISTS

Investing in the education and development of young scientists and engineers is a critical role of NSF and a major step the Federal Government can take to ensure the future prosperity and welfare of the U.S. Currently, the economic situation is negatively affecting the job opportunities for young mathematicians at universities, companies, and other research organizations. It is not only the young mathematicians who are not being hired that suffer from these cutbacks. The research community at large suffers from the loss of ideas and energy that these graduate students, postdoctoral fellows, and early career researchers bring to the field and the country suffers from the lost innovation.

In light of this situation, SIAM strongly supports significant funding for the Graduate Research Fellowship (GRF) program and the Faculty Early Career Development (CAREER) program. Strong investments in these programs will support thousands of new graduate students, which will help develop the country's next generation of scientists.

Before reaching the graduate and early career stage, young mathematicians and scientists gain critical interests and skills as undergraduates. SIAM supports efforts by NSF to improve undergraduate science, technology, engineering, and mathematics (STEM) education, and notes the key role that mathematicians play in training for these fields. SIAM strongly supports the proposed NSF and Department of Education initiative to improve K–16 mathematics teaching and learning. As interdisciplinary research questions become increasingly central to scientific progress, students need early exposure to research experiences and interdisciplinary challenges. SIAM also strongly supports the NSF Expeditions in Education (E²) initiative to link NSF research and education activities to enable hands-on learning on cutting-edge systems and catalyze student engagement.

MATHEMATICS AND INTERNATIONAL SCIENCE AND ENGINEERING

Science knows no borders, and nowhere is this truer than in mathematics. Mathematical research typically advances through the close collaboration of small groups of researchers, without the need for expensive equipment and using universal mathematical notation to minimize language obstacles. In addition, mathematics, as an enabling discipline for all of science and technology, and as a foundation for science education, plays a key role in addressing many of the most challenging problems that the world faces, such as infectious disease and sustainable energy generation. International scientific cooperation is not just good science, however; it can also foster understanding and goodwill between societies more broadly. Mathematical and

scientific activities can aid in promoting United States international policy goals by building relationships and trust with other countries, enhancing the global image of America, and spurring global development.

SIAM believes strongly in the Federal Government's support of international science and technology initiatives that help advance U.S. foreign policy and security, including cooperative research programs that further scientific knowledge applicable to major societal challenges, promote development of research and education capabilities abroad, and introduce U.S. students to global issues and collaborative relationships.

CONCLUSION

We would like to conclude by thanking you again for your ongoing support of NSF that enables the research and education communities it supports, including thousands of SIAM members, to undertake activities that contribute to the health, security, and economic strength of the U.S. NSF needs sustained annual funding to maintain our competitive edge in science and technology, and therefore we respectfully ask that you continue robust support of these critical programs in fiscal year 2014.

We appreciate the opportunity to provide testimony to the Committee on behalf of SIAM. SIAM looks forward to providing any additional information or assistance you may ask of us during the fiscal year 2014 appropriations process.

PREPARED STATEMENT OF THE SIGNERS OF THE TEACHER AT SEA ALUMNI PETITION TO SAVE THE NOAA TEACHER AT SEA PROGRAM

I respectfully submit the following outside witness testimony to this committee on behalf of the 274 people who signed our "Save NOAA's Teacher At Sea Program" petition, which can be found on-line at the following address: <http://www.ipetitions.com/petition/noataas/>.

The Teacher At Sea Program at NOAA is a rare gem. It is a program which has many years of proven work training teachers in science, technology, engineering and math (STEM) subjects and ocean science. It is a program which is unique and one that has generated exceptional results. Taking the program funds from such an extraordinary program and giving them to the Department of Education makes no sense. NOAA is uniquely set up to continue what it has been doing so well for so long. If you do anything to this program, expand it.

The need for excellent training for teachers in STEM has never been greater in the history of public education in the United States. Only 15 percent of our college graduates receive undergraduate degrees in the natural sciences or engineering. In China, that number is 50 percent. In France, 47 percent. In Korea, 38 percent and in Singapore, 67 percent.¹ The Next Generation Science Standards have just come out and for the first time in decades, we have the beginnings of a national response to the need to elevate the training of the next generation in STEM areas which are so critical to our Nation's future. Now is the time to increase funding to the Teacher At Sea Program run by NOAA. This excellent program has developed a proven model for providing the highest quality teacher training experience and has been successfully operating for decades. Teachers are partnered with researchers and sent on research vessels where they work as part of the science crew on a NOAA research ship. The program allows teachers to be completely absorbed in learning for weeks at a time at the side of experts in the field. By working on ships at sea in remote areas, teachers experience science in a real, vivid and exciting way. This is not in a text book, not in a lab and not in any classroom.

One of the most striking things that I saw as a Teacher At Sea in the Bering Sea was that the adventurous side of this wonderful program enabled me to reach a set of students who were completely uninterested in every other part of the science curriculum. They reported being bored in class but would run home to watch the television program "Deadliest Catch" on the Discovery Channel. I remember how shocked they were when they followed my adventures and realized that I was traveling to the same waters and doing much of the same activities, but was doing so to gather data for a research project. These students never looked at science the same way again. They were energized and engaged in the subject. Many for the first time.

¹ On, Committee, National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. New York: National Academies, (2007).

This program is life changing for students and teachers. Over the years, I have met many former Teacher At Sea participants. The words that all of us use to describe our experience are “life changing.” I use those words too. I do not use them lightly. I have taught in four States. I have seen a lot in education, and “life changing” is not something any of us in the program say or even think very often. The principal reason for our use of the term is the depth of the training. Spending weeks doing science in remote places at sea gives teachers an appreciation of ocean science, of research in remote places and of the adventure of science and learning. Teachers remember their experience and they view science differently from that time on. Most teacher training and coursework helps teachers to learn more about science and pedagogy. The Teacher At Sea program lets teachers experience real science in a unique way which is unlike anything else they do in their career. Teachers develop relationships with scientists which last for years and serve as a support in the classroom. Teachers stay on the ship for weeks at a time, not just for a few hours or a few days as they do in other courses or trainings that they take along the way. The depth of the experience is what sets this program apart. That difference is important. Only an agency dedicated to science could produce these kind of results. It is why this program needs to stay at NOAA where it currently resides.

Oceans represent 72 percent of the Earth's surface. The United States loves its beaches and its bounty. We consume about 4.8 billion pounds of seafood a year. The seafood industry is just one of the many sectors of our economy which depend on the ocean. From fishing to shipping to oil exploration to tourism, the sea generates billions of dollars a year for the United States. But in spite of the importance of oceans and ocean science to our culture and our economy, this area of research has been ignored in many Earth Science curricula around the country. Fortunately, the new standards will change that for the 26 States which have adopted them. However all States need to ensure that they have highly trained staff who can help implement what is for many a new area of curriculum. There is no better training anywhere in the world than working on the science crew of a research ship and learning the ins and outs of marine research directly from the scientists who conduct it. Teachers leave this experience with a vast array of knowledge which they bring back and transmit to the students they work with and the other teachers they work next to. In addition to knowledge, the teachers also form relationships with the scientists and often, those scientists serve as a resource for both teachers and students. In my experience, I was assisting a scientist who studied shell disease. My students, along with their homebase teacher, created an experiment and reported their data to the scientist after I had come ashore. The scientists wrote back and we had an exchange which deeply affected the students I worked with. The idea that they could contribute findings to his project—one which they had become very familiar with—was empowering to them, and for most, was the highlight of their year.

Many of the ocean scientists who I have met over the years have expressed concern over the fact that fewer people are going into fields related to ocean science. Prevent this tragedy by funding programs that bring teachers and students together with marine scientists. We live in a period of time where the decisions human being make will determine the fate of much of the planet we share. The oceans and all creatures great and small that live in them are deeply effected by our human activity. From over-fishing, to plastic debris, to the introduction of invasive species, to oil spills, to changes in our climate, and more, there has never been a greater need for good marine scientists. Now is the time to increase funding to NOAA's Teacher At Sea which has a proven track record of bringing students, teachers and marine scientists together, and which has decades of experience educating and exciting young minds with the adventure of real science.

PREPARED STATEMENT OF THE NATURE CONSERVANCY

Thank you for the opportunity to comment on the fiscal year 2014 appropriations for the National Oceanic and Atmospheric Administration (NOAA). The Nature Conservancy (Conservancy) is a non-profit conservation organization working around the world to protect ecologically important lands and waters for both people and nature.

As the nation enters the fiscal year 2014 budget cycle and another year of fiscal challenges, the Conservancy recognizes the need for fiscal restraint and reiterates our concern that natural resource stewardship programs should not shoulder a disproportionate share of cuts in this budget. Hurricane Sandy and its aftermath have made it clear that addressing coastal resiliency and protecting coastal communities

are fundamental to public safety, health, and economic well-being. Many of the NOAA programs highlighted below support the very coastal habitats that serve as natural buffers for storm surge and hurricanes and therefore protect people and property. Now, more than ever, these programs deserve our full support.

Our recommendations this year generally align with the funding levels currently contained in President Obama's proposed budget for fiscal year 2014. As an organization that prides itself on public-private partnerships with coastal communities and people who make their living from the sea, we strongly believe that the budget levels we support represent a prudent investment in our country's future. It is an investment that not only helps NOAA achieve its most critical missions by catalyzing local and regional action, but also reduces risk and saves money based on tangible economic and societal benefits that natural resources provide each year to the American people.

Fisheries Management.—The 2007 amendments to the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) were intended to end overfishing in the United States and reduce destructive fishing practices in U.S. waters. Further, it included new provisions that create mechanisms for communities to engage in conservation efforts while securing the contribution of marine fisheries to their local economies. NOAA Fisheries, in implementing the MSFCMA, has made important strides in addressing these challenges and strengthening fisheries management; however, much more needs to be done. To recover fish stocks so that they provide food and jobs to struggling fishermen now and in the future, we need to reduce destructive fishing practices, restore coastal habitats that produce fish, and support the efforts of fishermen and local communities that depend on fishing—and do so in a way that engages fishermen in collaborative efforts. The following NOAA programs are essential to achieving healthy coastal habitats and continued robust fisheries management.

Habitat Conservation and Restoration.—Coastal wetlands and nearshore waters produce the fish and shellfish that feed America. The health of these places is essential to the economic and social well-being of those who live and work in coastal communities. Restoration and protection of natural defenses such as salt marshes, oyster reefs, seagrass meadows, and coral reefs help to provide flood control and prevent erosion to protect our communities from storm surges. Since 2001, The Nature Conservancy and NOAA have partnered through the Community-based Restoration Program (funded under the Fisheries Habitat Restoration line along with the Open Rivers Initiative) to restore the health of degraded habitats in places and ways that benefit not just local marine life, but communities and coastal economies as well.

Through the 130+ community-based projects supported in the first decade of this partnership, NOAA and the Conservancy have helped protect vital coastal and marine habitat, restore species that keep coastal systems healthy, remove invasive species, create shellfish spawning sanctuaries and reestablish water flows to estuaries. Beyond the environmental benefits, these projects show that restoration pays off for coastal communities, producing jobs for direct restoration work and supporting coastal communities through increased fish and shellfish production. A recent economic analysis of oyster reef restoration in the Northern Gulf of Mexico provided compelling evidence for such claims, finding that two reefs totaling 3.6 miles would increase economic output of commercial finfish and crab landings by \$35,000 per year; cut wave height and energy significantly, reducing shoreline erosion and associated damages to private property and public infrastructure; and remove up to 4,160 pounds of nitrogen per year from Mobile Bay's waters.¹

Through our on-the-ground experience, we recommend \$47 million for Habitat Conservation and Restoration in fiscal year 2014, of which no less than \$25.7 million should be dedicated to the Community-based Restoration Program (CRP). Additional funding beyond cooperative agreements and program administration of CRP should be dedicated to the Open Rivers Initiative.

National Catch Share Program.—Catch shares give participating fishermen a stake in the benefits of a well-managed fishery and align the incentives for resource stewardship with the natural incentive for fishermen to increase their earnings with a sustainable business model. Transition to these systems is difficult and getting the design and implementation of these new catch share programs right, including provisions to engage fishing communities, is critical. The Conservancy supports the \$28.2 million listed in the President's budget for the National Catch Share Program.

Annual Stock Assessments.—Magnuson-Stevens mandated that annual science-based catch limits be in place in all fisheries to prevent or end overfishing by 2011.

¹ Kroeger, Timm (2012). "Oyster Reef Restoration in the Northern Gulf of Mexico: Ecosystem Services, Economic Benefits and Impacts, and Opportunities for Disadvantaged Coastal Communities." The Nature Conservancy.

While this milestone has been achieved, there is room for continued improvement in fishery data collection and stock assessments. Accurate and timely stock assessments are essential for the sound management of fisheries and the sustainability of fishing resources. The Conservancy supports \$69.3 million for annual stock assessments.

Pacific Coastal Salmon Recovery Fund.—The Pacific Coast Salmon Recovery Fund (PCSRF) is the most critical Federal program addressing major threats to Pacific salmon so that these fish can continue to sustain culture, economies, recreation, and ecosystem health. PCSRF funding is tailored for each State, competitively awarded based on merit, and has funded hundreds of successful, on-the-ground salmon conservation efforts. PCSRF invests in cooperative efforts to conserve species under the National Marine Fisheries Service jurisdiction, and projects are matched at a 3:1 ratio (Federal/non-Federal) and have resulted in significant progress in protecting and restoring salmon across their range. Notably, the PCSRF has catalyzed thousands of partnerships among Federal, State, local, and tribal governments, and conservation, business, and community organizations. The Conservancy urges sustaining at least the fiscal year 2013 level of \$65 million for the competitive and proven PCSRF grants program.

Species Recovery Grants.—Through this program, NMFS provides grants to States to support conservation actions that contribute to recovery, or have direct conservation benefits for, listed species, recently de-listed species, and candidate species that reside within that State. The Conservancy supports \$17.8 million for Species Recovery Grants.

OCEAN SERVICES

Over the years and across many sites, NOAA has been an invaluable partner to the Conservancy. NOAA programs that provide practical, community-oriented approaches to restoration, resource management, and conservation are natural fits for the Conservancy's mission. The Coastal Services Center and National Estuarine Research Reserve programs educate hundreds of local community officials and practitioners on better ways to apply tools and science. In addition, NOAA's data, research, and monitoring of coastal and marine systems directly provide data and decision-support tools that inform the safe operations of industry, prioritize habitats for restoration, and advance science-based management decisions. The following funding recommendations highlight critical programs that support productive coastal communities and healthy coastal and marine environments.

Coral Reef Conservation Program.—The decline of coral reefs has significant social, cultural, economic, and ecological impacts on people and communities in the United States and around the world. The Conservancy works with NOAA's Coral Reef Conservation Program under a competitively awarded, multi-year cooperative agreement to address the top threats to coral reef ecosystems: climate change, overfishing, and land-based sources of pollution. Together we develop place-based strategies and resilient marine protected area networks, measure the effectiveness of management efforts, and build capacity among reef managers globally. The Conservancy supports no less than \$26.8 million to provide funding to support the Coral Reef Conservation Program.

Coastal and Estuarine Land Conservation Program.—Created by Congress in 2002 and formally authorized in 2009, the Coastal and Estuarine Land Conservation Program (CELCP) has helped preserve approximately 45,000 acres of America's most important coastal areas. All Federal funding for CELCP is leveraged by at least an equal amount of State, local and private investments. There is significant demand for coastal conservation that is not being met. In the last several years, NOAA has identified and vetted more than \$270 million in coastal projects that are eligible for CELCP funding. The Conservancy recommends no less than the \$3 million present in the President's budget to support a program that utilizes both acquisition and conservation easements to protect coastal and estuarine lands considered important for their ecological, conservation, recreational, historical or aesthetic values. Land acquisition or conservation easements acquired with CELCP funds are protected in perpetuity so that they may be enjoyed by future generations.

Regional Ocean Partnerships.—Funding will provide support to implement priority actions identified by the Regional Ocean Partnerships, including the Northeast Regional Ocean Council, the Mid-Atlantic Regional Council on Oceans, the South Atlantic Alliance, the Caribbean Regional Ocean Partnership, the Gulf of Mexico Alliance, the West Coast Governors' Agreement on Ocean Health, and the Council of Great Lakes Governors. These multi-State collaborations originated to address regional priorities such as habitat conservation and restoration, energy siting, coastal resilience to severe storms, coastal water quality, and regional data and science

needs. Additional funding should be provided to support State and regional engagement in the development of marine planning, including stakeholder processes and consensus building tools, analysis of data and information, and facilitation of broad public participation in the planning process. The Conservancy supports \$5 million to advance vital regional ocean and coastal priorities.

National Estuarine Research Reserve System.—The National Estuarine Research Reserve System (NERRS) partners with States and territories to ensure long-term education, stewardship, and research on estuarine habitats. Atlantic, Gulf, Pacific, Caribbean and Great Lakes reserves advance knowledge and stewardship of estuaries and serve as a scientific foundation for coastal management decisions. The Conservancy recommends no less than \$22 million in the budget for the NERRS.

National Marine Sanctuaries Program.—National marine sanctuaries support economic growth and hundreds of coastal businesses in sanctuary communities, preserve vibrant underwater and maritime treasures for Americans to enjoy, and provide critical public access for ocean recreation, research, and education. Investment in these sites does more than simply protect small areas of the ocean—it places a down payment for the many Americans whose livelihoods are dependent on a healthy ocean and coasts. The Conservancy supports no less than \$46.4 million for the National Marine Sanctuaries Program.

Thank you for this opportunity to share with the Committee the Conservancy's priorities in NOAA's fiscal year 2014 budget. We would be pleased to provide the Subcommittee with additional information on any of the Conservancy's activities described here or elsewhere. Please contact me if you have questions on which we might be of assistance.

PREPARED STATEMENT OF THE PLANETARY SOCIETY

“NASA! NASA! NASA!”

—The crowd in Times Square after the Curiosity rover landed on August 6th, 2012.

The Planetary Society has deep concerns about the continued effort to defund Planetary Science in NASA's 2014 budget proposal. The budget ignores Congress's rejection of similar cuts proposed in fiscal year 2013 as well as the public's strong support of this highly effective part of NASA. The proposed cut threatens U.S. leadership in deep space exploration and planetary research, and it creates negative long-term technological and engineering consequences for the aerospace industry. Without immediate investment in technology and mission development—not possible under the fiscal year 2014 proposal—the United States will go “radio dark” in almost all regions of the solar system by the end of the decade.

On August 6th of last year, millions of people around the world watched as NASA's Curiosity rover landed on Mars. It was NASA's greatest—and most visible—triumph in years; the result of a decade's worth of steady investment in planetary exploration. Curiosity captured the public's imagination, becoming the “Apollo moment” for a new generation of Americans by inspiring countless numbers to pursue careers in science, math, engineering, and related fields.

But the fiscal year 2014 budget does not support the robust investment in Mars exploration required for there to be any more “Curiosity moments.” NASA was able to assemble a new mission for 2020 that duplicates the design of the Curiosity rover, but there are no longer the resources for long-term technology development to create the next generation of missions to the Red Planet. It is not clear whether the 2020 Rover will follow recommendations of the National Research Council's Planetary Science Decadal Survey and cache samples of Mars to be returned to Earth in the future. The fiscal year 2014 budget and its projection ensure a moribund future for our Mars program.

The proposed budget for fiscal year 2014, \$1.217 billion, represents the latest in a multi-year effort to underfund Planetary Science within NASA [Fig. 1]. Though this number looks larger than was projected in fiscal year 2013, there are important caveats to consider. Included in fiscal year 2014 are two new requests to the program: \$50 million for Pu-238 production previously located in the DOE budget, and \$20 million for near-Earth object (NEO) detection in service of the asteroid retrieval mission. While both of these are important, we must consider \$1.147 billion to be the “true” number when comparing to last year's appropriation. As such, fiscal year 2014 represents a \$268 million cut from levels approved by Congress in fiscal year 2013 (before sequestration and rescission).

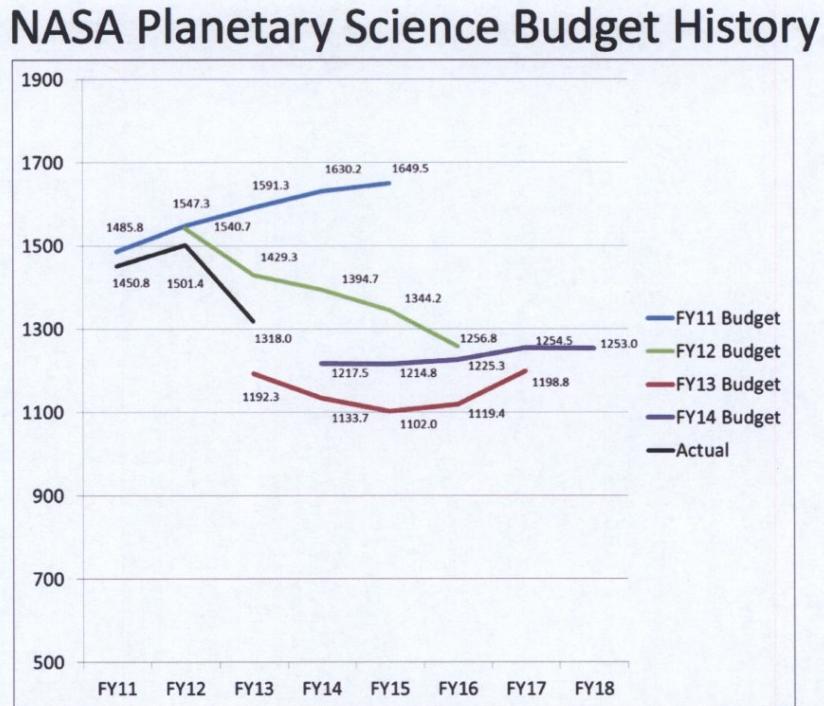


Fig 1: Comparison of the budget projections for Planetary Science (in millions of dollars) over the past four years. Note that the "Actual" line assumes an even application of the sequester and rescission for FY13 and the FY14 budget includes the new funding for Pu-238 and NEO detection.

The fiscal year 2014 budget also ignores the \$75 million approved by Congress in fiscal year 2013 to begin formulation activities for a mission to Jupiter's moon Europa and dismisses any possibility of a mission in the near future. We urge Congress to provide continued funding for a Europa mission and to encourage NASA and the administration to commit to this popular, scientifically important project.

The Planetary Society would like to highlight one positive aspect of the fiscal year 2014 budget, which is that proper funding is requested to restart Plutonium-238 (Pu-238) development. Pu-238 is a power source for spacecraft that cannot use solar panels, such as missions to deep space or to targets bathed in shadow. The United States stopped producing Pu-238 in the late 1980s and our supply is now at critical levels. It takes many years to generate usable plutonium, and we strongly encourage Congress to fund its development as requested to prevent future shortages.

In difficult economic times, The Planetary Society recommends that Congress prioritize the effective and productive Planetary Science Division within NASA and fund it at \$1.5 billion per year. This is a modest increase above the request and represents less than 9 percent of NASA's total budget while supporting an extremely successful part of the agency. According to our analysis, this level is the minimum necessary to support a balanced program that follows the recommendations contained within the NRC's Planetary Science Decadal Survey, which includes a flagship mission to Europa.

NASA is one of the great scientific and cultural institutions of the United States. It has the unique responsibility of inspiring the public through unprecedented achievements in human and robotic exploration into the depths of space. Decades of strong, bipartisan support of NASA have created the world's leading engineering and scientific space agency. In challenging economic times, we encourage Congress to support the part of NASA that has consistently delivered on its promises: Planetary Science.

**PREPARED STATEMENT OF THE UNITED STATES SECTION OF THE PACIFIC SALMON
COMMISSION**

Mr. Chairman, my name is David Bedford, and I serve as a Commissioner on the United States Section of the Pacific Salmon Commission (Commission). The Commission was established in 1985 to oversee implementation of the Pacific Salmon Treaty (Treaty) between the United States and Canada. In May of 2008, the Commission concluded bilateral negotiations that developed revised salmon fishing regimes for the period 2009–2018. The provisions of the new fisheries agreements were approved by the Federal Governments of the United States and Canada and are being implemented for the period 2009–2018. Funding in the Department of Commerce budget for the programs intended to fulfill national commitments created by the Treaty was \$10,859,253 in the 2012 budget. Funding for the Treaty is located in three lines in the National Marine Fisheries Service budget for Salmon Management Activities: the Pacific Salmon Treaty line, the U.S. Chinook Agreement line, the 2008 Agreement line and in the International Fisheries Commissions line in Regional Councils and Fisheries Commissions.

The implementation of the Treaty is funded through the Departments of Commerce, Interior and State. The Department of Commerce principally funds programs conducted by the States of Washington, Oregon, Idaho and Alaska and the National Marine Fisheries Service. The costs of the programs conducted by the States to fulfill national commitments created by the treaty are substantially greater than the funding provided in the NMFS budget. Consequently the States supplement the Federal Treaty appropriations from other sources including State general funds, Dingell-Johnson grants, and Pacific Coastal Salmon Recovery. To maintain programs necessary to meet treaty commitments funding for 2014 at the 2012 level of \$10,859,253 may be sufficient provided that all of the other sources of funds remain available.

The Pacific Salmon Treaty line Item of the National Marine Fisheries Service budget funded at \$5,622,690 provides base support for the States of Alaska, Washington, Oregon, and Idaho and the National Marine Fisheries Service to conduct the salmon stock assessment and fishery management programs required to implement the Treaty's conservation and allocation provisions for coho, sockeye, Chinook, chum, and pink salmon fisheries. Effective, science-based implementation of negotiated salmon fishing arrangements and abundance-based management approaches for Chinook, southern coho, Northern Boundary and Transboundary River salmon fisheries includes efforts such as increased annual tagging and tag recovery operations, harvest monitoring, genetic stock identification and other emerging stock identification techniques.

The Chinook Salmon Agreement line item in Salmon Management Activities funded at \$1,836,563 supports research and stock assessment necessary to acquire and analyze the technical information needed to fully implement the abundance-based Chinook salmon management program provided for by the Treaty. The States of Alaska, Washington, Oregon, and Idaho, and the 24 treaty tribes conduct projects selected in a rigorous competitive process.

The International Fisheries Commissions line, under Regional Councils and Fisheries Commissions in the NMFS budget is funded at \$400,000 and provides the U.S. contribution to bilateral cooperative salmon enhancement on the transboundary river systems which rise in Canada and flow to the sea through Southeast Alaska. This project was established in 1988 to meet U.S. obligations specified in the Treaty and has been funded annually at \$400,000.

The 2008 Agreement line supports programs necessary to reach the agreement on revised fishery provisions between the U.S. and Canada in 2008. The level of funding needed for 2008 Agreement programs is \$3,000,000. The U.S. Commissioners view continued funding in the fiscal year 2014 Federal budget as necessary to address Chinook salmon conservation needs and to meet existing treaty commitments.

The core Treaty implementation projects included in the Pacific Salmon Treaty line, and the U.S. Chinook Agreement line under Salmon Management Activities as well as the International Fisheries Commission line under Regional Councils and Fisheries Commissions consist of a wide range of stock assessment, fishery monitoring, and technical support activities for all five species of Pacific salmon in the fisheries and rivers between Cape Suckling in Alaska to Cape Falcon in Oregon. The States of Alaska, Washington, Oregon, Idaho, the National Marine Fisheries Service (NMFS), and the 24 treaty tribes of Washington and Oregon conduct a wide range of programs for salmon stock abundance assessment, escapement enumeration, stock distribution, and fishery catch and effort information. The information is used to establish fishing seasons, harvest levels, and accountability to the provisions of Treaty fishing regimes.

The base annual Treaty implementation funding of approximately \$5.6 million has remained essentially flat since the early 1990s while the growing complexity of conservation-based, and Endangered Species Act compliant fishing regimes has required much more intensive stock assessment, fishery compliance monitoring, and technical support activities. In order to continue to fulfill the Federal commitments created by Treaty, the States have had to augment Federal funding with other Federal and State resources. For example, additional funding has included Federal Anadromous Fish Grants, Federal Pacific Coast Salmon Recovery Funds (PCSRF), Federal Dingell-Johnson dollars, and State general funds. However, alternative sources of funding have seen reductions or in some cases been eliminated. The Anadromous Fish Grants were eliminated in the Federal fiscal year 2010 budget. Uses of PCSRF monies were constrained in fiscal year 2010 by new appropriations language and further constrained in 2012 by the NMFS. State dollars and Dingell-Johnson grants have been significantly reduced during the current economic downturn.

The U.S. Fish and Wildlife Service measures the economic impacts of commercial and sport fisheries for the States involved in the Treaty at approximately \$2 billion–\$3 billion per year. Effective implementation of the Treaty is necessary to continue the Federal Treaty conservation-based fishing regimes that contribute to the sustainability of salmon stocks, the significant number of jobs supported by the fisheries and the large economic return to the States and communities. To accomplish this funding is needed at the 2012 level of \$10,859,253.

This concludes the Statement of the U.S. Section of the Pacific Salmon Commission submitted for consideration by your committee. We wish to thank the committee for the support given us in the past. I will be pleased to answer any questions the Committee members may have.

SUMMARY OF PROGRAM FUNDING FOR THE U.S.-CANADA PACIFIC SALMON TREATY
DEPARTMENT OF COMMERCE, NATIONAL MARINE FISHERIES SERVICE

	Amount
Pacific Salmon Treaty Line Item:	
National Oceanic and Atmospheric Administration (NOAA):	
National Marine Fisheries Service (NOAA Fisheries)	\$1,030,224
Alaska Department of Fish and Game	2,906,814
Washington Department of Fish and Wildlife	881,428
Oregon Department of Fish and Wildlife	540,589
Idaho Department of Fish and Game	263,635
Pacific Salmon Treaty line item total	5,622,690
International Fisheries Commissions line item (TBR) (Transboundary Rivers Agreement)	400,000
U.S. Chinook Agreement line item (LOA)	1,836,563
2008 Agreement line item:	
Coded Wire Tagging (CWT) Improvement Program	1,500,000
Puget Sound Critical Chinook Stock Program	1,500,000
Total	3,000,000
Total Department of Commerce—NOAA (including TBR)	10,859,253